CHEMICAL MARKETS

VOL. XXIX | AUGUST, 1931 | NO. 2.

The Eternal Triangle

No one can be much surprised at the break-up of the Nitrogen Conference, since the competition it was organized to temper contained irreconcilable elements. This does not mean that a truce will not be patched together this Autumn; but it will be an expediency designed to meet the critical financial and political needs of the moment and cannot be regarded in any sense a permanent declaration of peace to end the nitrogen war.

When a natural material, a by-product, and a manufactured chemical meet in three-cornered competition for the same market, as is the case when Chili nitrate, ammonium sulfate, and synthetic nitrates seek to supply the fertilizer demand for nitrogen, the economic base of each contestant is so radically different that neither price agreement nor allocation of markets can furnish reasonable grounds for adjustment.

These fundamental differences are only made the more serious by the vital importance of nitrogen to foodstuffs and to explosives, which inevitably involves both the public and the government of every industrial nation. These political problems enormously complicate the nitrogen situation, but at the present time the financial pressure, especially upon Chile and Germany, may very likely force an agreement upon some kind of live-and-let-live terms.

The market situation precipitated by the disagreement of Lucerne is utterly intolerable, for ammonium sulfate is currently offered at prices below the costs of conversion and transportation. When the by-product material sells at a loss, obviously nitrogen prices have been driven beneath the rock bottom of this market. Neither the natural nor the synthetic products are in effective competition at this price level, and sulfate alone cannot satisfy the demand. The natural curtailment of sulfate supplies this year will help the present crisis. On the other hand the price-and-market-agreement in effect during the past twelve-month has piled up big excess stocks of all three types of material in most of the producing countries. If these were liquidated negotiations might at least proceed from a fair starting point.

Sooner or later the nitrogen war will have to be fought out to a definite conclusions and the new economic balance struck; but it does not appear that any of the combatants is ready today to face the ultimate issue.

SYMBOL of QUALITY
KALBFLEISCH
CHEMICALS
FOR OVER A CENTURY

The SYMBOLS OF CHEMICAL NOMENCLATURE

"To most people . . . even the symbols of chemical nomenclature . . . are but a stumbling block, and are usually passed over in the reading as would be a quotation from the Arabic or Chinese."

A YELLOWED and tattered copy of the Scientific American for October 1880 produced this little paragraph and the amusing engravings . . . part of an article describing in the flowing language of the day, the Works of Martin Kalbfleisch's Sons.

And the commentator might well have added that the mystery surrounding chemical terms makes imperative a *reliable source* for purchasing chemical substances.

Even at that date, Kalbfleisch would have been the answer; for already we were fifty-one years old, and well established as suppliers of quality chemicals.

And now, fifty years later, there is even wider recognition of the Kalbfleisch excellent service and products . . . by those who know "chemical nomenclature" as well as by those who simply *specify Kalbfleisch.*

The
KALBFLEISCH
Corporation

ERIE, PA.
ELIZABETH, N. J.
KALAMAZOO, MICH.
WATERBURY, CONN.
CHATTANOOGA, TENN.
DeQUINCY, LA.

PENSACOLA, FLA.
KOKOMO, IND.
CINCINNATI, OHIO
CAMP VERDE, ARIZ
JOLIET, ILL.

535 Fifth Avenue New York, N. Y.

"Three Times— and Out" Upon the blanket charge of conspiracy to effect wholesale diversion of denatured alcohol from legitimate industrial uses, an indictment has been secured in Baltimore against a number of chemical companies. Although several new defendants appear—among them some prominent and long established corporations—the charges and the evidence appear to be the same as brought forward in Trenton two years ago, when a grand jury refused to indict, and in Buffalo, April, 1930, when an indictment was returned but no conviction secured against any firm which by any stretch of the imagination could be classed as an established chemical house. This is the third time the same charges have been preferred upon the same evidence.

We protest that such prosecution savors over-much of persecution, and we recall an ancient principle of our law that no one shall be put in jeopardy for the same offense more than once.

Prohibition enforcement is so saturated with graft and politics that even the man on the street is naturally suspicious of its good faith, and it is quite impossible for anyone who knows the business standards of some of the defendant corporations in this case not to seek ulterior motives in these sensational charges so widely broadcast. It is no secret that there are sharp differences of opinion among high prohibition officials, as to the extent of the diversion of industrial alcohol and on the best means of controlling the denatured alcohol traffic. Possibly it is significant that the instigator of all three of these cases has been Inspector Page, one of the strong so-called "Anti-Saloon League men." It is an interesting fact that Assistant District Attorney Youngquist, from Mr. Mitchell's office, especially asked that no indictments be found against several of the companies.

This case should be brought speedily to trial and verdicts rendered in language so plain that the good name of the honest manufacturer and distributor of industrial alcohol shall not again be smirched.

Shifting Copper Sulfate Markets A reverse English has been administered to rumors that the Mond Nickle Company—largest British producer of copper sulfate—planned to withdraw from the manufacture of this important agricultural and industrial chemical, by the recent announcement in the English chemical press that this company will increase the annual output of its Clydach plant to a total of 50,000 tons. Although our English contemporaries credit "official sources" with this interesting news, nevertheless American producers are inclined to doubt its accuracy. If true—and we see no reason to doubt it—this is an expansion program bound to have international effects.

A Mond production of 50,000 tons would give this single company an output roughly equal to the present total of all manufactures in the United Kingdom and something over twice the total output in the United States. It is moreover, a production equal to half the estimated present output in Italy, where Montecatini has been expanding their copper sulfate operations as a part of their co-operation in Mussolini's plans to make that country self-supporting in chemical and other basic supplies.

These Italian ambitions have already touched both British and American makers of blue vitriol, who are finding the big market in Italian vineyards curtailed, and as a result compete more strenuously in South America. It would not appear to be a particularly auspicious time to increase British production, although their Sulfate of Copper Association, Ltd., which handles all foreign business, is efficient and aggressive; and we venture the guess that there is something very tangible in the guarded statement which hints at increased economies to be effected in the new Mond plant. The company is in an obviously favorable position as regards raw materials costs, and the market future holds some interesting possibilities.

De-coding Ethics The commendable practice of the Government acting as a medium for the codification and dissemination of simplified practice recommendations is bearing fruit. To-date, one hundred and forty-nine general conferences have been held, resulting in accepted recommendations for one hundred and seventeen commodities. It would be difficult to estimate the savings thus effected.

Industry has not been so fortunate in the negotiations pointing to recognition of trade associations as a vital force in stabilizing prices and eliminating many predatory practices. After months of hard work several important branches of the chemical industry have formulated plans of conduct which were agreed to in spirit at least by the Federal Government. A few months ago the fertilizer industry was

informed that the ethics acceptable a year ago, are no longer viewed with favor, and within the past month, the disinfectant and insecticide industry received similar notification. It would be well to wait until the Government is certain of its own ideas before additional branches of the chemical field waste their time and patience.

What Is "CD No. 5"? Up to December 1st, 1930 completely denatured alcohol formula No. 5 contained four parts of methanol. During the month of December of last year, this CD No. 5 contained two parts of methanol. From January 1st to July 15th, 1931, the No. 5 denaturant was the much debated alcotate. From July 15th to August 15th, either the alcotate or the isopropyl formula may be used as CD No. 5. After August 15th CD No. 5 becomes isopropyl.

CD No. 5 is, from any point-of-view, the most important denaturing formula on the list. It is to be devoutely hoped that the Commissioner of Internal Revenue has collected accurate production figures for these different formulas and different periods: statistics, the accuracy of which promises to be extremely important, are needed to answer many questions bound to arise over conversion.

It is a pity that some distinguishing mark for the radical differences in formula was not adopted. This would certainly have been a convenience to the producer and the chemical using trade, and would have avoided misunderstandings and mistakes which have already occurred. Contrarywise, definite information as to the formula employed could not but have been extremely valuable information in the hands of the prohibition officials.

Chemical "White Collar" Employment Present business conditions call attention to the necessity for better facilities for handling employment within the industry. The chemical industry has fared better than most others. Nevertheless, a large number of men are seeking positions. Poor business, amalgamations, technological unemployment are a few causes that have put good men in research, plant, sales, and administration out of work. In many instances these men and their dependents are suffering real hardship.

The most feasible plan seems to be the formation of a committee representing such organizations of the industry as the American Chemical Society, the American Institute of Chemical Engineers, the Salesmen's Association, and the Manufacturing Chemists Association. None of these is peculiarly fitted to undertake the task, but the commendable work of the Chemists' Club Employment Committee, under D. H. Killeffer, is a starting point, though it has been too localized and not so universally used or supported as it deserves. It might well be the nucleus of such an effort. Make the organization self-sustaining, permanent, national in scope, worthy of the support of employer and employee alike, and a real, timely mutual benefit will result in a very short period of time.

The industry would benefit in having more applicants from which to choose and a quicker response from likely candidates. One of the liabilities of the industry at the moment is the unemployment of men who could contribute much to its advancement. A national employment exchange under the auspices of the leading executives and technicians of the industry would place these men in the shortest time where they can do the most good.

Quotation Marks

The present century is one in which the mantle of power is passing to the chemical industries. In all branches of production mechanical processes give way to chemical processes.—*Ignace Moscicki, President of Poland.*

But the chief credit for Italy's great crop should be given to the Montecatini Company, the great manufacturing concern that supplies fertilizer materials and mixed fertilizers of all sorts to all Italy. Without these fertilizers and the constant propaganda which was put out by the company no such result could have been achieved.—*The American Fertilizer.*

The functions of advertising are to retain old customers and obtain new ones—and the latter is far the more valuable.—*Textile Colorist.*

Fifteen Years Ago

(From our issue of August 1916)

The Great Western Electro-Chemical Co., starts operations for the manufacture of caustic soda, chloride of lime and other chlorine products at its plant at Pittsburg, Cal.

The Barrett Co., formerly the American Coal Products Co., reports a balance equal to 24½ per cent on the $11,298,000 common stock earned in the six months ending June 30.

A camphor industry is said to be quite possible in Florida where a number of plantations are established.

The Casella Color Co., is the first to receive a part of the 200 tons of dyes brought over by the German submarine, the Deutschland.

Oxalic prices are reported as weakening from 75 cents per pound down to as low as 60 cents.

Mutual Chemical Co. of America stock is quoted at $150 a share.

Science and Industry

By Sir Harry McGowan, K. B. E.

Sir Harry McGowan, as head of the I. C. I., and President of the Society of Chemical Industry, is perhaps, the best informed authority in Europe today on the subject of the inter-relationship of chemistry and business. His address at the jubilee meeting of the Society, while not as revolutionary in thought as Dr. William J. Hale's recent article, "The Chemical Road to Progress," nevertheless, is a pronouncement worthy the closest attention of chemical executives in this Country

FIFTY years ago a band of earnest workers in their craft founded the Society of Chemical Industry. This year, therefore, we, its members, with pardonable pride, celebrate our Jubilee. It is a happy trait in human nature to pause at suitable occasions during the onward march and reflect upon the progress that has been made. A Jubilee is such an occasion. We shall not, then, be false to any true instinct if we cast a glance back over the past 50 years and measure, however summarily, the achievement of these five past decades. No band of workers labours entirely to itself. No tasks are essayed, and no achievements accomplished, apart from the environment provided by the community of which it is a part. Let us recall for a moment, therefore, some marks of progress of that community between 1881 and the present year 1931. First, because chemical industry serves the people, let us note that the population has grown from 35 to 49 millions. After eliminating, so far as possible, the movements of the price level, British aggregate international trade has grown by 103 per cent. The estimated National income has increased from about £1,800 millions then to about £3,600 millions today. In each case I have used the level of today's values. On these estimates the income *per capita* has risen by 43 per cent. Today, therefore, these islands support a greater population, and maintain them in a much higher standard of comfort, than was the case when our Society was first established. Against that background we should, naturally, expect that chemical industry had progressed at least *pari passu* with this movement in general numbers and wealth. It is, therefore, more than gratifying to record that the exports of British chemical industry have progressed during this period by 94 per cent, as compared with an increase of 53 per cent for all descriptions of British exports.

The historian of the future will recognize that this 50 years has marked the development of a new industrial revolution. When he seeks for the cause, he will find it in the labours of the scientist, and not least among those scientists will be ranked the chemist. Had not the work been so ably accomplished by another hand, I might have been tempted to devote this Presidential Address to a survey of the successes registered during this last half century by chemical industry. Happily, however, you can read the tale in Dr. Miall's "History of the British Chemical Industry," where, with unerring discrimination, he paints a brilliant picture of an equally brilliant period.

Chemical Industry in the Past

I am justified, however, in bringing back to your mind for one moment the development by Castner of the electrolysis of sodium chloride; the discovery by Castner and Kellner of a new method of making sodium by the electrolysis of brine; Dr. Ludwig Mond's invention by which chlorine was produced by passing the vapour of ammonium chloride over nickel oxide and the consequential knowledge which was gained and applied to refining pure nickel from mixed ores; Hall's process for making aluminum from cryolite; the world-famous MacArthur-Forrest cyanide process for extracting gold and silver from refractory ores and tailings; the Haber-Bosch process

"In some respects the scientist has an easier task than the industrialist, because our industrial system is clothed in a fabric of money."

"No industrialist to-day seeks to build his own fortune at the cost of the workers."

for the fixation of nitrogen; the Bergius process for the hydrogenation of coal into oil; the amazing developments in the dye industry, including the discovery of solubilised vat dyes for acetate silk, with many allied processes. This period also embraces many achievements in the fine chemical industry, including the discovery of phenacetin, aspirin, adrenaline, salvarsan, and insulin. In the cellulose field we have had the wonderful advances in artificial silk, which have brought a new clothing fabric to the service of the world. In metallurgy, in the gas industry, as in the manufacture of paints and varnishes, soaps, and explosives, similar giant steps in the march of progress are to be recorded.

Chemical Industry of the Future

The broad task of chemical industry is to bring to man's service an ever widening knowledge of the uses to which the materials found in this world of ours may be put. Great as has been the progress in this direction, since the first chemist began his experiments, it has only served to show how much more there is to be known. There is no complete earthly book of this knowledge. It has to be hewn from nature bit by bit, every piece being used to build a path leading into the further unknown beyond. The hidden laws of nature have to be traced and formulated. Every resource of the scientific method is pressed into service. By analogy and hypothesis new theories are formed, and by experiment and observation they are tested and approved, or rejected. We find definition becomes ever more precise, and classification into group and sub-group, order and sub-order, grows continually more complex. With added knowledge new techniques are evolved. Today the chemist finds his problems extending into new fields where pressures and temperatures not dreamed of by his predecessor consitute fresh weapons in pushing back the barriers of knowledge. This work progresses not only in chemical industry itself, but also in other industries, where the chemist, in alliance with other scientists, is exercising his activities in what may perhaps be considered more concentrated fields. This urge for knowledge is universal, and it must continue to grow as the struggle for development by individuals and nations becomes more intense. It is to be found in the workshop and in the laboratory. It is equally present in the industrial world and in the academic sphere. It is no national phenomenon, but international. We should do well to remember that no country in these matters has a monopoly of ability, nor are there any national boundaries standing in the way of the diffusion of new knowledge.

The discoveries of the chemist may represent to him a final achievement, but to the industrialist they may be but the beginnings of a new problem. The task of the industrialist is an economic one. He has to hold the balance between the application of new discoveries and the preservation of existing economic equilibrium. His acid test is the test of profits; and the test of profits is the relation between their amount and the amount of capital employed in their realization. Both are measured in money. The industrialist has first to reconcile, therefore, the expense of the search for knowledge with the money yield which that knowledge may be expected to produce. In doing so he has to strike a balance between present expenditure and future earnings. Nice weighings of facts and probabilities are involved. For example, the facts may mean the immediate obsolescence of valuable plant, or they may involve definite losses on existing stocks. Such points as these may be easily determined, but greater difficulties attend the forecast of the effect of new products on public demand. When discovery comes, he must be quick to adapt it to his immediate purposes. If he delays, the fluidity which characterizes new knowledge may carry it to his rival, who, more sensitive in his perception of values, may skim the cream from a future market. In this field he has little more than his past experience to guide him, although to some is given a certain flair, or intuition, call it what you will, as to what the public may appreciate. The industrialist cannot put a thousand customers in a laboratory and experiment with their tastes. Business earnings, therefore, must cover remuneration for all these risks.

Let me now further develop my theme that the problem solved by the chemist and presented to the industrialist is a problem still. In a more extended sphere the application of new knowledge springing from the chemists' efforts may derange whole industries. It may raise vast problems—social, financial, and political. Most industrial enterprises are founded upon an expectation that they will endure for a long period of time, and it is upon this basis that capital is invested. Let us look a little more closely into this. Industrial capital is most familiar to us in its fixed form of buildings, plant, and machinery. Ancillary to this is the capital represented by houses and shops, places of amusement and recreation, hospitals, administrative offices, and all the fixed capital of our social life. The value of these assets lies in their use and the necessity for their continuance. Destroy the background of time and purpose against which they have been erected, and that value vanishes. This capital represents the product of human labour. While men and women devoted their labours to the creation of these forms of capital, they produced no goods available for immediate consumption. The food, clothing, shelter, recreation, etc. which they

needed during the period of this task were provided by others. It was because those others refrained from consumption equal to their own production—in a word, because they saved—that it was possible for these capital assets to be accumulated.

When new knowledge and the developments therefrom challenge the necessity for existence of an already established production, resting upon such a capital base, they may threaten the whole life of such a community, the value of all that capital, and the utility of all the saving habits from which it sprang. Nationally, the threat may be internal or external. In the case of artificial silk, it was both. The existing textile industries found a new supply in their midst, at home and abroad, insisting by the merit of its own attractions on a share of public demand. Cotton and wool had to take note of a new rival. These industries had to consider the effect of this new development on the volume of their production. A reduction in this volume would disturb the balance of relation between profits and investment, and capital which appeared stable in value might prove more or less worthless. The chemist is producing new utilities, new advantages, and new attractions. To him, as I have said, they are achievements. He leaves to the industrialist the task of modifying the existing structure and of re-aligning present methods to meet any threat which endangers the life of an older industry.

But the stone which the chemist has thrown into the waters has caused still wider circles, again interfering with existing economic equilibrium. Aided by the knowledge of brother scientists, studying the processes of nature, he has succeeded in furnishing the plants in the field with the sustenance which previously they drew through nature's slower channels. The fertilizer industry has been the result, and now, where once men feared scarcity, they stand stifled by plenty. It is not the chemist alone who is responsible. Other scientists must share the credit or the blame. But the chemist's research on fertilizers, coupled with the successes of the botanist and the ingenuity of the machinery engineer, have worked miracles. The major balance between industrial and agricultural production has been dislocated. As a consequence stocks have accumulated, and prices have fallen steeply. The story of a definite lack of equilibrium between demand and supply is to be told of wheat, sugar, coffee, tin, rubber, petroleum, and many other commodities. The scientist may congratulate himself on having made two sugar canes grow where before there was one, or on having provided an illimitable supply of new fertilizers, but the industrialist may see his financial structure tumbling about his ears. The scientist may say that he has produced new adjustments leading to a greater productivity, and, asking whether that does not mean greater wealth, he may call upon the industrialist in turn to make his adjustments.

In some respects the scientist has an easier task than the industrialist, because our industrial system is clothed in a fabric of money. Disturbances of this kind are apt to involve consequences which tear great holes in the monetary clothing, and surfaces which appear stout and safe may suddenly yield to these unexpected strains.

Law of Supply and Demand

Every improvement in process, every bit of added mastery over nature, tends to lead to an increased supply of goods. Whether or not that increase is met by a corresponding increase in demand, springing either from the growth of population, or from the balancing growth of other supplies, price movements are inevitable so long as monetary conditions in general remain unchanged. During the past year or so the industrialist has seen this happening in the case of almost every prime commodity. The rapid, nay disastrous, fall in wholesale prices is within the knowledge of you all. It has been accompanied by a similar, though smaller, fall in the price of manufactured goods. In such circumstances the industrialist sees his monetary turnover gradually diminishing. There is the double effect of a fall in unit price and a fall in volume. The industrialist can never forget that profits are a residual balance of the aggregate money he receives after he has met all the costs of his manufacture. Even if every cost were falling at a like rate with the fall in sale prices, then the amount of money profit resulting from his operations would still be reduced. As I have said, the test of the amount of profit made is the relation of those profits to the amount of capital employed. Now it is well-known that in our balance sheets the amount of capital of a company is not subject to alteration merely because prices are altering. A pound issued in the form of capital ten years ago is still a pound today, notwithstanding that the amount of goods which that pound will buy now may be substantially larger than the amount that it would have bought at the date when the capital was issued. A reduced volume of profits arising from a fall in sale prices, therefore, involves a reduction in the ratio of those profits to the fixed capital shown in the balance sheet. That in itself leads to criticism of the industrialist, but if a true view is taken any such criticism is found to be entirely unjustified.

"The broad task of chemical industry is to bring to man's service an ever widening knowledge of the uses to which the materials found in this world of ours may be put."

"The discoveries of the chemist may represent to him a final achievement, but to the industrialist they may be the beginnings of a new problem."

In the foregoing statement I have assumed for the sake of argument that all costs show a similar fall, but this, of course, is not the case. In agriculture, costs are a much more fluid factor than they are in industry. The unit of production is very much smaller, consisting commonly of the farmer and a very few co-workers. When the price of agricultural products falls there is no mystery about it, and there is no difficulty in ascertaining the facts. The prices of wheat, wool, sugar, and coffee, for instance, on the principal exchanges of the world are quoted in every paper, they are common subjects of conversation, and no agricultural employee can long remain in ignorance of any drastic alteration in the value that the product of his labour fetches in the world's market. The difficulties, therefore, of securing adjustments in agricultural wages and other costs, excluding those which arise from the purchase of manufactured objects, are not nearly so great as those which arise in the industrial field. There is no such common knowledge of the prices realized by manufactured goods. They are so infinitely more varied in their nature, in their purpose, in their form and scope that this easy knowledge of variations in their price cannot be attained. As a consequence, the vast number of workers in industry are slow to realize that the products on which they labour are bringing in less money, and equally slow, therefore, to grasp the fact that unless all costs fall proportionately with prices, business will be lost, production curtailed, and employment reduced. Until knowledge of the altered conditions percolates through all ranks of workers, there arises a break in the exchange of products. In other words, trade is depressed.

Again, the custom of borrowing capital at fixed rates of interest on the security of manufacturing assets throws up hampering consequences, when prices are falling. Out of the smaller profits arising, fixed interest of this kind takes the same amount of money, thus leaving all the effects of the fall in prices on those who carry the risk of the whole operation, namely, the ordinary shareholders. Dividends are reduced, market values of shares decline, and the purse of the investor is closed to invitations to subscribe to new enterprise.

The same difficulty arises in national finance when a large proportion of the public expenditure is represented by unchanging rates of interest on a National Debt. Nearly every country of the world today is faced with this new burden. As prices fall, profits and employment decline and all forms of taxation produce lower yields. The aggregate national revenue, therefore, decreases, but as fixed Debt charges remain immutable, their pressure naturally leads to Budget deficits, and the rules which require that national budgets shall be balanced then interpose to demand that higher taxation shall be levied upon trade. Industry today is already staggering under the burden of taxation, particularly in the form of income tax on the reserves which it makes out of its profits for the purposes of strengthening the financial structure of industry. When higher taxation is imposed, as it was last year, the amount of free money which industry has available in the form of its reserves is still further reduced. This again hampers the ability of industry to extend its activities, or even to improve its equipment so as to reduce costs, both contributory factors of the highest importance in remedying the evil of unemployment.

International Trade Tariffs

The growth in scientific knowledge and its rapid diffusion throughout the world, coupled with the increasing attention paid to education, is accentuating the controversy between those who believe in free trade and those who believe in protection. So rapid has been the advance in knowledge and in its mechanized mass application, that today there is not a great difference in the efficiency of different nations who are using the same mechanical methods, if not in many cases identically the same machines. When this like use is accompanied by different standards of life, then the competitive position of two nationalities on different scales of living has a new meaning. In Great Britain we have for many years enjoyed a high standard of living, which we have been able to uphold by a high rate of productivity. Up to the outbreak of the war we were able to maintain our international trade because the value that we offered in our products was able to compete successfully with that of other nations, despite their lower wage scales and lower standards of living. The arrival and development of mass production methods is, however, changing all that. The Eastern races with their lower standards are adopting modern mechanical means of production and offering their products at prices with which on our higher standard of life it is impossible to compete. For this reason today we see much of the cotton trade of Lancashire passing to Japan. India, under her new policy of protective tariffs, is developing her manufactures, increasing, for instance, her production of iron and steel, and substituting an internal for an international exchange of trade. Our own Dominions are fired by the same ambition of being entirely self-supporting. The British industrialist today, therefore, finds market after market being lost, either because such a high tariff barrier is imposed that his goods cannot meet the competition of locally protected goods, or because of the adoption of these newer methods of production based on lower standards of living. Although the ideal of the protectionist is that every country should live entirely to itself, importing nothing and exporting nothing, few countries in the world could actually carry out this programme. But whatever doubt may exist as regards other nations, it is certain that the British Empire, if properly integrated and moved by a common ideal, could very nearly achieve that position with very little loss or cost to itself as a whole.

I have said enough on this part of my subject to lay before you clearly not only how the chemist has set the industrialist a problem, but also the economic and financial facets of that problem. Let me now turn to some of the methods which in my opinion must be employed in solving it. Perhaps you will not dispute that this problem raises issues for the industrialist even more intractable than those which the scientist has to face. What is the industrialist doing? In the main his search has been for additional financial strength. For the rest he has sought to bring about a general realization of the common problems facing world industry. He has striven to avoid the waste of excess investment in new capital goods which will arise when fresh savings are applied to increasing supplies in an already overloaded world. He has endeavoured to parcel out the existing markets on some intelligent and intelligible system.

The search for additional financial strength has led to the development of larger and larger industrial units. These units have been formed by absorption, or by cartels linking different units of an industry together in a loose yet well-defined manner, or through the medium of a holding company exercising a direct financial control over a group of subsidiary companies. Chemical industry in particular has been a leader in this direction, choosing as its instrument the holding company. My own life has been largely concerned with this matter. I have long believed in and practised cooperation. I have trusted in the restraint that would be, and has been, used by large corporate business enterprises in the exercise of their powers. In Germany, in the United States, in France, in Switzerland, and in this country chemical industry has been a leader not only in the formation of large enterprises, but in the more difficult task of international cooperation. Great benefits have flowed from these measures, both to those engaged in them and to the consuming world at large. Some effort has been made to limit the investment of capital to the needs of demand, and in that way overlapping and wasteful competition have often been avoided. Ordered marketing has in many cases replaced disorderly and costly scrambling for trade. It must not be supposed, however, that perfection in this matter has by any means been reached. There is still too much excess investment, too much waste of capital which could be better applied to the production of other goods serving the public needs. There is still in many directions a tendency to over-supply, pressing down price beneath its proper economic level and reducing the yield on actual capital invested below a proper economic rate.

For this the wave of economic nationalism which has passed over the whole world since the war is largely responsible. It is a natural though lamentable effect of the war itself which, interfering with normal exports of goods from the belligerent nations, has led many neutral countries to determine that, as an insurance against any future similar occurrence, they will develop their industries until all their needs can be supplied by home manufacturers. But while this policy is understandable, it is not quite feasible. If a number of countries close their markets by high tariff barriers and supply all their own manufacturing needs, and at the same time have a surplus of exportable agricultural products, obviously they will find their general production unbalanced, and their exports a drug on a disappearing international market. That is happening today. The country which suffers the greatest injury from these methods is, naturally, the country which is the greatest international trader, namely, Great Britain.

Effect of Tariff Barriers

Secure behind high and ever-rising tariff barriers, many industries have used political power to claim monopoly of their national markets, coupled at the same time with the right to share in such international markets as may not at that time have carried their fiscal policies to the same point. To cope with the anticipated demands of markets measured on this basis, the flow of capital savings has been devoted to the wasteful multiplication of manufacturing capacity. In addition, the struggle for markets has unduly swollen distribution expenses. To cover them an ever-increasing volume is necessary, and that volume is today being secured by quoting international prices at a level which is subsided by home-protected prices. The task of the industrialist in Great Britain, in meeting this forced competition, in carrying the growing burden of necessary research, in providing for the risk of obsolete plant and processes, and in meeting the increasing demands of taxation, is ever growing heavier. His workers can meet any foreign industrial skill, his staff can rival any international ability, his research workers can march with those of any other nation, so long as the fight is otherwise on level terms. When he finds, however, that more and more markets are being closed against him, so that his volume of output is reduced and his workers are unemployed, he begins to question how long he can sustain the fight. When he is faced in international discussions, not only with the fair forces of competition, but with the unfair tariff bar of entry into the markets of his competitors, coupled with the claim of unfettered right of entry into markets as yet free from the tariff barrier, he is compelled to ask whether he should not be equally armed with the monopoly of his own national market.

Three Corrective Measures Needed

Faced by all these difficulties, as an industrialist I look to three remedies. The first is the adoption of a tariff in this country. The second is the promotion of a real economic union between the different free nations making up the British Commonwealth.

The third is the still greater unification of various industries in each country, coupled with wider measures of planning of industrial effort.

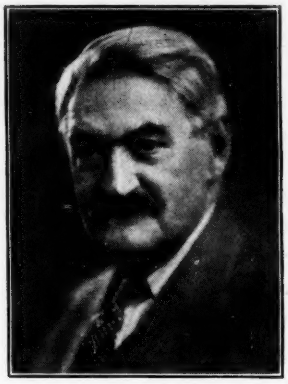
Turning to a still larger sphere, the world appears to need a more deliberate international purview of its various industries. For instance, why should we not consider an international chemical council? It might consist of representatives of all the principal chemical industries throughout the world. They could meet from time to time to consider problems common to them all. A permanent secretariat could exist whose duty it would be to collect information from all the members showing what is taking place in regard to research, production, costs, and stocks, indicating proposals which are in mind for future extensions, and so on. In this way the world chemical industry would provide itself with an eye with a world-wide range, and be indeed rationalized. There would no longer be opportunities for the industry suddenly to be surprised by the emergence of fresh supplies of some particular product, or excess investment of capital in one particular direction, or any sudden emergency which wrecks prosperity. Research could be co-ordinated, the burden of its expense reduced, safeguards provided for rewarding the units which contributed new knowledge, while even the present rapid dissemination of discoveries could be expedited for the better service of mankind. I commend this thought to your consideration.

Chemistry and Politics

I mentally withdraw a little to get it into proper focus, and I ask myself—on the basis of what I have said—what of the future? The chemist cannot be stayed in his work. His activities must continue on an ever increasing scale. His successes will still present to the industrialist the problems of which I have spoken, but similarly these problems must increase in perplexity. He has to bend his mind towards their solution, and that solution can only be found by the closest team work. We need a General Staff for British Industry, in which industrial, labour, financial, economic, and marketing experts will survey our national position, mobilize and plan our efforts, and give to our knowledge, skill, and ability a co-ordinated strength far greater than that attainable by our present disjointed, spasmodic, and individualistic efforts. For that we need more facts, better analysis, more consultation, especially among apparently diverse interests, and a larger appreciation of the whole economic background against which industrial activities are carried out. Armed in this manner, Great Britain can likewise plan her future industrial development, and guide her destines with reason. Our political leaders will then pay more and more attention to such a voice of trade and industry, for by those the peoples of the nations live.

We Congratulate—

We congratulate John F. Queeny because as a youngster he made records as buyer for Myer Bros. and salesman for Merck that are still remembered in the drug trade: because he fathered the Monsanto Chemical Works, reared it through a sickly babyhood and an uncertain adolescence to lusty manhood: because at sixty-eight he retired to England to build a British branch factory and sales organization: because of the financial statement his company has just made for the first six months of this year: because he has one of the choicest collections of paintings in all the Middle-West: because he is the father of Edgar M. Queeny: because he is the only major executive in chemical fields who has filled every position from office boy to chairman of the board and can at seventy-two still set the pace for any department manager in his organization because—most of all—he is John Queeny, hard fighter and stout friend.



John F. Queeny

"During a quarter of a century," said a big textile mill owner last winter, "we have bought tons of chemicals from Joseph Turner, and no shipment has ever been a day late nor any bill a penny out"—hearty and appropriate praise for a chemical sales record doubtless unique, and undoubtedly the result of Joe Turner's life-long habit of getting what he goes after. He was born in England on August thirteenth, sixty-one years ago, and from 1881, when he went to work as office boy, till 1922, when he became their successor, he worked—as few men work nowadays—for the old Riker firm. He likes to fish off the Florida Keys in winter; to buy his straw hats in August; and to sell oxalic acid any day in the year. He hates promises, market reporters, and golf. He lives in Glen Ridge, N. J., and his only child, married Harold Fyffe, his associate in Jos. Turner & Co. We hail him—a shrewd, most vigorous, famous chemical merchant of the Old School.

Joseph Turner

Bookshelf

Practical Stock Market Forecasting, by William Dunnigan, 108 pages, published by Financial Pub. Co., Boston. $2.50.

Presenting a composite stock market barometer evolved from the study of eight barometers now in use in forecasting conditions.

An Economic History of the United States, by Edward Frank Humphrey, 648 pages, published by Century, N. Y. $3.75.

A history of the United States written in the light of the newer trends of economic thought, attempting to discover in the record of our past experiences an explanation of conditions as they are today: and stressing personalities and movements rather than statistics.

Bridge Engineering, by Frank O. DuFour and C. Paul Schantz, 516 pages, published by American Technical Society, Chicago. $3.00.

A manual of practical instruction in the analysis, calculation, and design of steel truss and girder bridges for railroads and highways, intended for the beginner and the self-taught practical man as well as the technically trained expert.

Lime - Chlorine Treatment of Sewage

By W. V. Brumbaugh*

WHILE the subject of the treatment of sewage is not a new one—the first studies having been made seventy-five years ago in London, followed in 1887 by experimental investigations in Lawrence, Massachusetts—nevertheless the complexity of the process, brought about by the changing character of the waste material to be treated and the chemical and biological reactions involved, necessitates constant new thought and research to cope with the situation and increase the overall effectiveness of the treatment.

Many processes have been devised, most of which were later discarded in favor of newer and better methods of treatment. Even today there are several different processes, or combinations of these processes, in use for the purification of sewage, but for the purpose of this discussion it is not necessary that the details be presented.

In recent years lime has been used to a limited extent in certain phases of sewage treatment, chiefly for the adjustment of the pH value, or acid-alkali ratio of the sludge in separate sludge digestion tanks. However, it has been found that in many cases it is only necessary to introduce lime to increase the alkalinity of the sludge in the initial stages of the biological reaction, after which the process proceeds without additional lime. For this, and perhaps other reasons, it may be said that lime has been losing out in this particular field.

However, within the past few months, practical application has been made of a new process for treating sewage which will be of interest not only to manufacturers of lime and chlorine, but also to public works officials responsible for the efficient and economical operation of sewage plants.

*Assistant Secretary, National Lime Association

The credit for the experimental work in connection with this new idea belongs to Mr. L. H. Enslow of the Chlorine Institute, who developed what is now known as the Lime-Chlorine Process. It is adaptable to many different stages in the already existing methods of treating sewage and active promotional work is now being initiated by the Chlorine Institute and chlorine manufacturers who are members.

Chlorine has long been recognized as a disinfectant in the treatment of both water and sewage. The research of the Chlorine Institute definitely indicates an increased efficiency in sewage chlorination if the chlorine is applied in combination with lime as calcium hypochlorite. The addition of lime increases the alkalinity of the sewage at the point of application of the chlorine, which results in the chemical formation of the compound known as monochloramine from the ammonia naturally present in sewage. Monochloramine gradually changes to dichloramine, both compounds being effective and persistent in sewage disinfection.

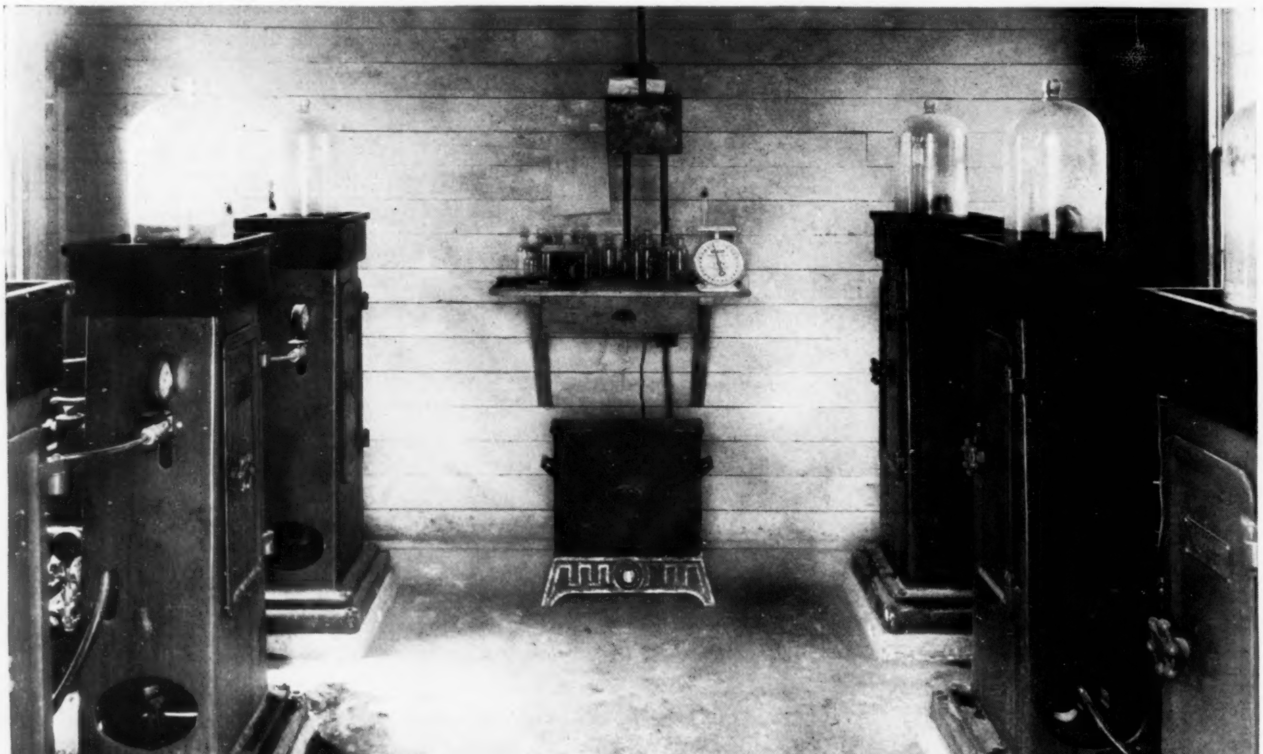
The process for producing calcium hypochlorite at the sewage plant, which is flexible to the extent of permitting a variation in the lime-chlorine ratio to suit specific circumstances, consists in the introduction of chlorine into a milk gas of lime suspension. The lime emulsion is made by mixing water with a controlled amount of lime released by dry-feed machines operating continuously. The production of calcium hypochlorite occurs rapidly if proper and efficient mixing of the lime and chlorine is provided.

While the system affords an opportunity to regulate the ratio of lime and chlorine to meet specific conditions, the use of 1.25 pounds of lime to each pound of chlorine will generally be sufficient to bring about the proper chemical reactions and provide the desired excess alkalinity at the point of application to the

sewage. Excess lime above the ratio mentioned will produce no undesirable effect and may actually prove beneficial if the alkalinity of the sewage is abnormally low. Conversely, a decrease in the lime used will lower the efficiency of the process somewhat.

The important point to remember is that while chlorine alone will do the job if proper attention is given to the installation of equipment and control of the feed, the addition of lime greatly improves the efficiency of the process and at reduced cost. For the sake of brevity, and at the same time to present in as concise a manner as possible the many distinct advantages of the lime-chlorine process, the following points are emphasized:

1. The lime-chlorine process may be applied to the treatment of sewage at different points for the accomplishment of various purposes such as odor control, sewer protection, disinfection, improved sludge digestion, higher efficiency of clarification in the settling tanks, etc.
2. For the attainment of a specific result less chlorine is required in the lime-chlorine process than would be necessary if chlorine alone were used. In other words, organic matter consumes less chlorine when lime is present and more bacteria are destroyed.
3. The cost of chlorination is reduced, even when the cost of adding lime is included. These cost ratios have been repeatedly proven to hold true for various sewages tested.
4. The compounds known as chloramines, which are produced from the ammonia naturally present in sewage when chlorine is applied in an alkaline carrier such as lime water, are very persistent bactericidal compounds, much more so than ordinary chlorine.
5. The lime-chlorine process insures the presence of residual chlorine for long periods of time. Therefore, it is of importance in chlorinating sewages some distance ahead of the treatment plant for odor control, sewage protection or disinfection.
6. In stream and river improvement—such as the prevention of septic action or odor nuisances, for the elimination of slime-like biological growths in the stream, or for algae control—the lime-chlorine process should prove more efficient at less cost than ordinary chlorination.
7. The application of chlorine fixed as calcium hypochlorite removes the possibility of volatile chlorine being liberated during passage through the treatment plant and pump stations. Thus the hazard of corrosion of equipment and the disagreeableness of working at times in an atmosphere of chlorine are completely avoided. Consequently, the necessity for careful control of the chlorine is lessened.
8. Because of its non-corrosive nature, the calcium hypochlorite solution can be carried great distances through inexpensive pipe materials, thus reducing installation costs and resulting in greater flexibility of the chlorinating arrangements. If necessary, the solution can be stored



Chlorinating equipment used in conjunction with hydrated lime to produce hypochlorite at the Baltimore Sewage Works

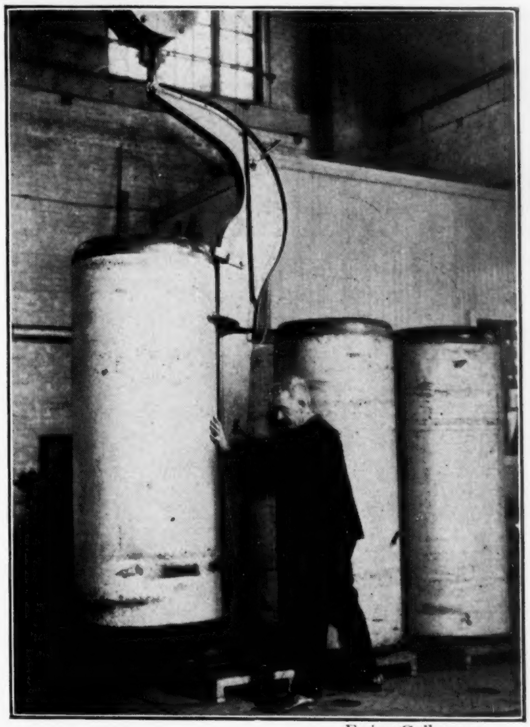
in a tank for application at increased rates when required.

9. The lime emulsion from the lime machines may be diverted in part for other uses at sewage plants wherever required. Chemical precipitation and sludge alkalinization may thus be employed seasonally or intermittently where desirable and from the same equipment used in the lime-chlorine treatment.
10. The lime-chlorine process may be employed, where necessary, without the use of refined equipment, although this practice is not recommended except for temporary advantages or preliminary experimental purposes.
11. Smaller sewage treatment plants can effectively use bleaching powder in place of lime and chlorine, thus reducing the cost of installing the process.
12. Sludge digestion may resaonably be expected to improve through the adoption of the lime-chlorine process, as is already evidenced in sewage plants employing prechlorination without lime. To what extent lime will improve the ordinary chlorine effect in this direction is speculative.
13. While ordinary chlorine does not show any pronounced effect in improving the efficiency of the activated sludge process in certain types of American plants, the use of bleaching powder in the same type of plant at Barnsley, England is decidedly beneficial. It is hoped and believed that the lime-chlorine process will produce results similar to those from bleaching powder at the English plant.
14. In prechlorination, the alkalinizing effect of the lime used with the chlorine may be reasonably expected to produce a higher efficiency of clarification in the settling tanks, if not better separation of grease.
15. In chlorinating ahead of sewage tanks which have long periods of detention, or low efficiency of solids and oxygen demand reduction, the lime-chlorine process may again be reasonably expected to exceed ordinary chlorination in over-all effectiveness.
16. Small quantities of the chlorinated lime water from the pipe lines may be drawn for sprinkling around the sewage plant on screenings and at other places of fly-breeding and localized odor production.

New Installations

The lime-chlorine process can undoubtedly be effectively applied to every city and town now treating sewage by any of the standard methods in use. Chlorine alone is considered an adjunct of practically every sewage problem and the addition of lime produces the double benefit of improving the efficiency of chlorine and at the same time reducing the cost of such treatment.

Dayton, Ohio is now installing the process for the purpose of odor control. Middletown, New York, is planning to adopt the new method to eliminate slime-deposition on the surface and beds of streams. The lime-chlorine process is now being used in Baltimore purely to control algae development and to eliminate nuisance from the tidal waters receiving sixty-nine to ninety million gallons of the treated sewage plant effluent each twenty-four hours. 385 tons of chlorine and from 360 to 480 tons of lime will be required annually. Although recently installed, the process is producing results which pass original expectations.



Ewing Galloway

Purifying drinking water for New York's millions takes large quantities of chlorine. A one-ton chlorine gas tank being removed to the jet room by means of a crane at the Kensico Dam, Westchester County, New York. New York City has not as yet undertaken the lime-chlorine process

A number of other cities and towns are now considering adoption of the process in one or more phases of their sewage treatment with the idea of securing more efficient treatment at a reduction in operating costs.

Montecatini Makes Favorable Report

A report has been issued by the Montecatini combine covering production and sales conditions during the first half of the present year. It is stated that whilst deliveries of pyrites are quite up to the level of last year, deliveries of superphosphate have fallen off considerably. Business in nitrogen compounds is characterized as satisfactory, whilst sales of sulphur and copper sulfate have exceeded last year's results.

How Poland rebuilt its chemical industry completely destroyed by the war is revealed in a study of Commercial Attache' Clayton Lane, Warsaw, which has just been issued by the Commerce Department as a trade bulletin.

Keystone

Wanted—New Uses

South's Oldest Chemical Industry In Chaos

THE naval stores industry is ailing. This is not a new phenomenon for within the past twenty-five years the industry has passed through six crises each of approximately two years duration.

Nearly half of the last quarter of a century has witnessed poor times in a branch of the chemical industry where we enjoy world supremacy because of our superabundance of natural resources. If an industry instead of satisfactory returns reports chronically only losses, or very small profits, there must be a reason. Overproduction brought about by small scale operations in the hands of many operators is the answer.

Causes of Depressions

The six crises of the naval stores industry occurred in 1908-09, brought about by overproduction, excessive stocks, and a major business depression; in 1913-14 again, overproduction and the failure of American Naval Stores Co.; in 1914-15, at the opening of the World War; in 1920-21; collapse of commodity prices following the cessation of the war and the subsequent accumulations of the largest stocks on record; 1924-25, again excessive supplies and poor prices built up by four years of unprecedented good business; and finally the present situation.

In every instance the industry has habitually turned to the same measures of relief—the formation of co-operative marketing organizations and measures of one sort or another for curtailing the succeeding crop. In each case the measures of relief have proven but mildly successful and often have resulted disastrously. In each crises the industry has stumbled through somehow, the weak falling by the wayside and the strong surviving.

The present bad situation had its inception in overproduction in the years 1927-28 brought on by the extremely high prices prevailing in 1925-26. In 1928-29 prices slumped again despite a slight reduction in the quantity in 1929 production. Conditions in 1928 became so bad that relief was sought once more by the favorite expedient of cooperative marketing and last July the Naval Stores Marketing Corporation was formed.

New Marketing Medium

This organization continued to function until a few months ago when it was merged into a still larger co-operative marketing body, The Gum Turpetine-Rosin Marketing Association. The formation of the Naval Stores Marketing Corporation tended to strengthen prices for the balance of the 1929 season, but with production in 1929-30 again back to extremely high levels the markets were again forced to bear a heavy burden of excess material.

The stock market break of October-November, 1929 found the naval stores industry already selling its products at fairly low levels. Accordingly there was no debacle in prices, such as occurred in most

other raw commodity markets. If 1930-31 production had been drastically reduced, naval stores might have weathered the continued reduction in consumer demand and prices would have been shaded only moderately. No effort—at least no successful effort—was launched to prevent the individual producers from repeating the folly of the previous crop and 600,000 barrels of turpentine were produced against 625,000 for year before. Only 25,000 barrels less was but a "drop in the bucket" and prices sank. Gamble's International Naval Stores Year Book for 1931-1932 states,'"That the average turpentine prices dropped to 40½ cents from 48¾ cents," (On July 17th, turpentine touched 31 cents at southern points), "the lowest average with one exception in thirty years and the average price of G. rosin dropped from $7.37½ to $4.75 the net return per unit at the stills dropped 30% from $62.38 to $43.96." The naval stores industry in facing its six crises was unquestionably facing one of large size proportions.

Naval Stores Are Farm Products

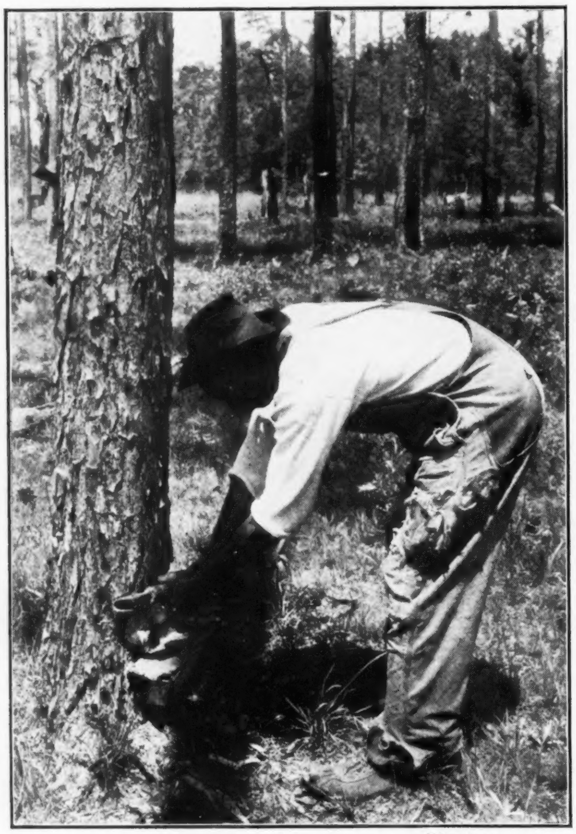
In the closing hours of the last session of Congress legislation was passed which permitted the Farm Board to recognize producers of gum turpentine and rosin as farmers. Previously the Board on several technicalities had declined to do so. The members of the marketing association are entitled to all the perquisites of farm relief. Government aid to the naval stores industry was extended once before in the crisis of 1914-15, but not to the present degree. Loans were made up to 65 per cent of the market value, but in July prices sagged to new low figures. Quotations at primary points were as low as 40 cents in Savannah and 38 cents in Jacksonville. Independents were reported as being willing to throw their holdings on the market for whatever they would bring. Chaos prevailed for a few days when the executive members of the Gum-Turpentine-Rosin Marketing Association led by T. J. Aycock appealed again to the Farm Board in Washington for an additional 15 per cent loan based on present market values. After a conference extending over several days the Farm Board decided that it would be impossible to place the additional loan for the cooperative members. It is understood that this decision was forced because of technical conditions. That these may be overcome and the loan granted is the last word to come from Washington.* The industry faces a more serious situation than ever before and is now fully recognized by all interested factions. This in itself may force the various elements to adopt corrective measures.

Governmental loans may, and probably will, tide the industry over the difficulties of the moment; but what about the future? Naval stores were for many years one of our most important exports, an important source of revenue. While other products have suc-

*Granted, July 29.

Keystone

A typical Southern scene and a splendid picturization of what is wrong with the naval stores industry—small operators working with crude and inefficient equipment

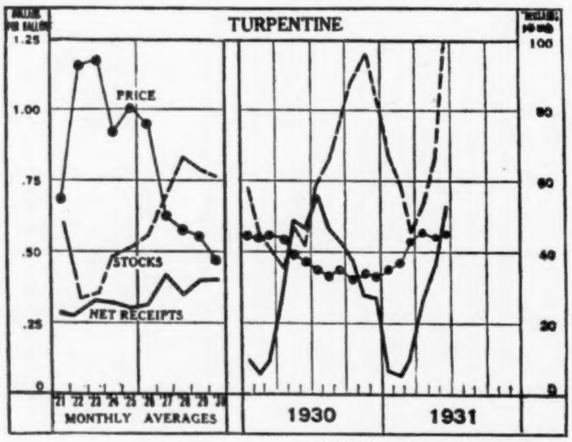


Keystone

The first step in the manufacture of gum turpentine and rosin is to tap the pine trees. Left, a turpentine "Chipper" is at work making ready for placing the cup, right top of the still

ceeded in increasing their foreign sales turpentine and rosin are still highly important to American prosperity.

Several permanent improvements may be made. First of all consumption may be increased by discovering and promoting new uses. A glance at the table below indicates quite clearly that in thirty-five years our production has increased but little. Secondly, the producers may follow the trend of the industrial chemical industry and amalgamate small units into larger ones. This, of course, has been done to a great extent with such large companies as Hercules Powder and General Naval Stores (Newport). This centrali-

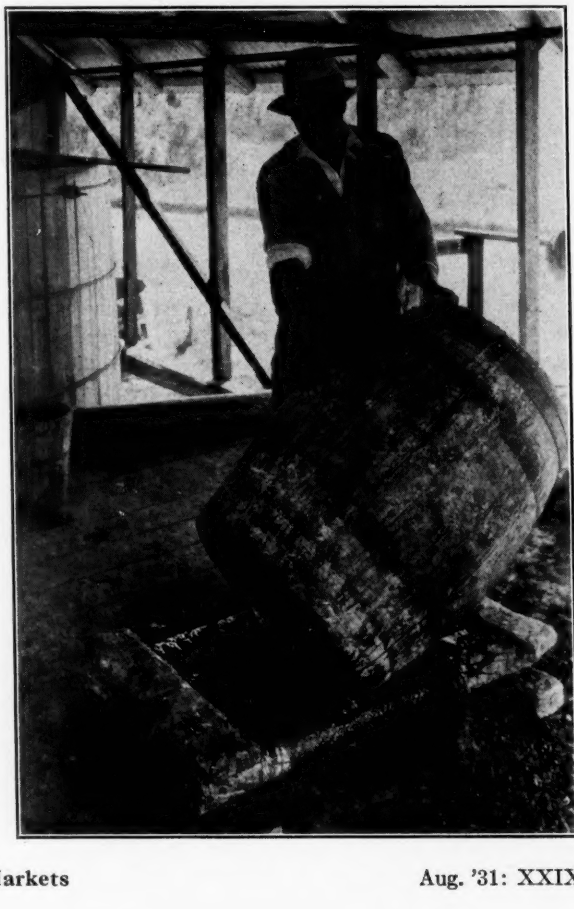


N. Y. Journal of Commerce

Price range, stocks and net receipts of turpentine for the past eleven years

Estimated Naval Stores Production*

Season	*Bbls. Gum Spts. Turp. (50 gals.)*	*Barrels Gum Rosins (500 lbs. gross 420 lbs. net)*
1930-31	600,000	2,000,000
1929-30	625,000	2,081,000
1928-29	560,000	1,865,000
1927-28	650,000	2,165,000
1926-27	510,000	1,700,000
1925-26	480,000	1,599,000
1924-25	530,000	1,765,000
1923-24	565,000	1,881,000
1922-23	520,000	1,731,000
1921-22	500,000	1,665,000
1920-21	525,000	1,748,000
1919-20	400,000	1,332,000
1918-19	340,000	1,132,000
1917-18	520,000	1,731,000
1916-17	610,000	2,032,000
1915-16	530,000	1,765,000
1914-15	560,000	1,865,000
1913-14	675,000	2,248,000
1912-13	715,000	2,381,000
1911-12	660,000	2,198,000
1910-11	615,000	2,047,000
1909-10	600,000	2,000,000
1908-09	750,000	2,498,000
1907-08	685,000	2,281,000
1906-07	588,000	1,958,000
1905-06	590,000	1,964,000
1904-05	600,000	2,000,000
1903-04	545,000	1,815,000
1902-03	581,000	1,935,000
1901-02	600,000	2,000,000
1900-01	620,000	2,065,000
1899-1900	535,000	1,782,000
1898-99	525,000	1,748,000
1897-98	500,000	1,665,000



*Gambles Naval Stores Year Book 1931-32.

CHEMICAL

Photographic Record

The chemical industry's most noted aviator is Luther Martin IV, Secretary, Wilckes, Martin, Wilckes, now Swann subsidiary. Officials of both companies often find the speed of Martin's plane a decided asset in commuting between New York and the company plants. Mr. Martin's series of articles on the lampblack industry is scheduled to start in an early issue. Mrs. Martin is also a licensed pilot and accompanies her husband on many of his business trips

Peters

The British Chemical Plant Exhibition opened July 13, Central Hall, Westminster, London by Sir Harry McGowan, President Imperial Chemical Industries. (story page 138). Also in the group is Dr. H. J. Bush; J. Davidson Pratt and on the extreme left, Dr. Bushner, President of the German I.G.

Keystone

Hotel Statler, center background, is the gathering point in Buffalo for the members of the American Chemical Society on the occasion of the Society's 82nd Meeting, August 31 to September 4. A record attendance is expected when Professor Moses Gomberg calls the various Sections together

Keystone

Merrimac Chemical (Monsanto subsidiary) is now comfortably settled in its new commodious offices at Everett, Mass. A long-felt need is finally satisfied and officials and employees alike are enthusiastic about the new quarters

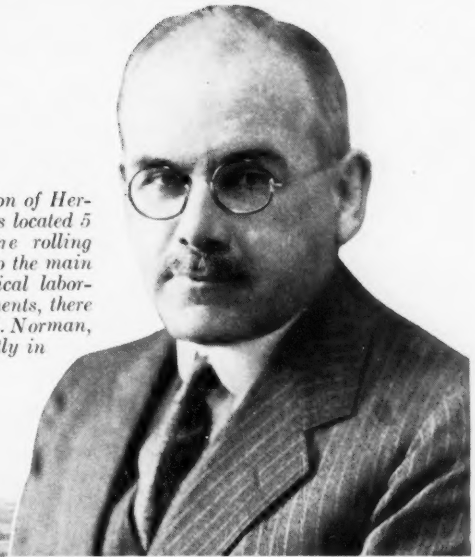
NEWS REEL

of Chemical Activities

U. S. Dept. Agriculture

Dr. O. E. May, of the Bureau of Chemistry and Soils, U. S. Department of Agriculture, demonstrating three stages of development in producing gluconic acid by mold fermentations. Test tube, flask, pan, shows progress of experiments from laboratory to commercial stage

Birdseye view of the new Experiment Station of Hercules Powder Co., recently completed. It is located 5 miles west of Wilmington on a 300 acre rolling Delaware countryside plot. In addition to the main building, housing the physical and analytical laboratories, library, offices and service departments, there are ten smaller buildings. Right, Dr. G. M. Norman, technical director for Hercules and directly in charge of research operations



The medical and chemical professions are this year celebrating the hundredth anniversary of the discovery of chloroform. Photograph shows the home of Dr. Guthrie at Sacketts Harbor, N. Y. The original house is still standing. Dr. Guthrie in addition to easing man's pain was also the inventor of percussion caps. While chloroform is primarily a medicinal chemical, it has several important industrial uses, as a solvent in the fat and oil industries, in the rubber field, gums and resins and in the cleaning of fine textile garments.


CHEMICALS OF QUALITY
Monsanto
ST. LOUIS, U.S.A.
A BACKGROUND OF 30 YEARS
OF MANUFACTURING

zation can be carried to greater lengths. Such action while having some points debatable as to their good effect, would certainly serve to stabilize prices, reduce overproduction, force the industry to scientific rather than rule-of-thumb methods of operation and probably conserve the natural resources.

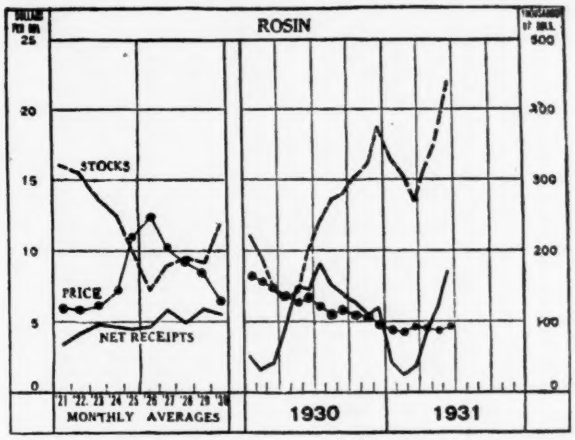
Third, the possibility that after repeated failures, or only partial successes, cooperative marketing may be placed on a sound and lasting basis.

Exports of Wood Rosin*

The exports of wood rosin, in barrels of 500 lbs., from the United States for the past five calendar years have been as follows: Prior to 1926 the reports did not separate gum and wood rosin.

Exports for 1926	147,325 bbls.
Exports for 1927	143,773 bbls.
Exports for 1928	151,836 bbls.
Exports for 1929	196,888 bbls.
Exports for 1930	195,214 bbls.

The future of naval stores consumption in the United States rests upon developing new uses and bringing the advantages of rosin and turpentine over substitutes to the attention of consumers. Actual consumption in the United States of turpentine spirits in 1929 totaled only 5,622,695 gallons as against 8,718,900 gallons in 1922. The greatest losses have occurred in the paint, varnish, and soap industries. It is imperative that the naval stores industry take steps to prevent the inroads of substitutes by keeping the purchasing industries acquainted with advantages of turpentine and rosin. Here apparently lies the salvation of the industry. New uses are possible. Synthetic camphor promises to help and points what may be done in other directions. At the moment we are producing little synthetic camphor. Most of our



N. Y. Journal of Commerce

present needs for this plastizier come either from Germany where the article is produced or from Japan, source of the natural material. The imports of syn-

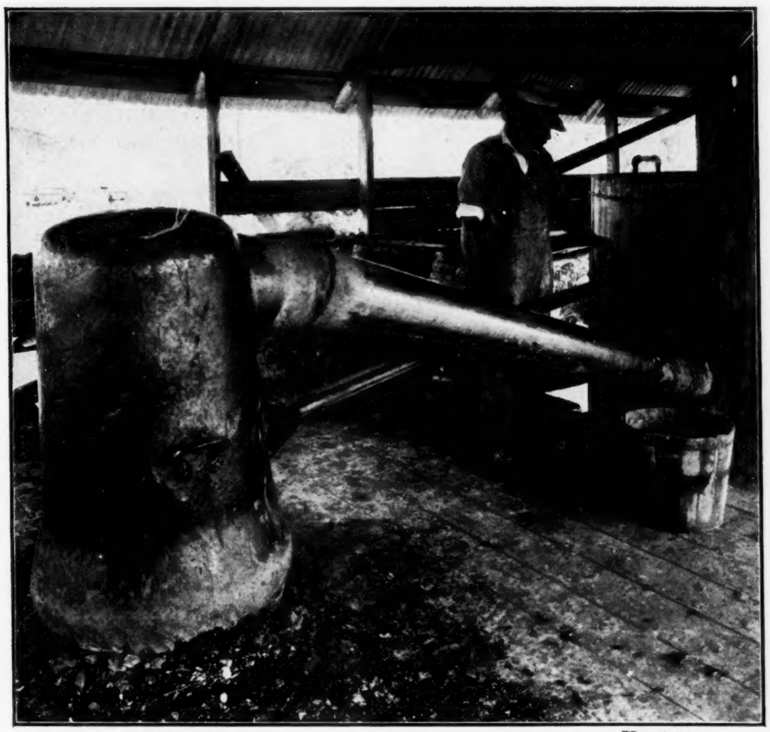
Exports of Wood Spirits Turpentine*

The total gallons of wood spirits turpentine shipped in the past nine years have been as follows:

Year	*Gallons*
1922	494,576
1923	393,082
1924	561,446
1925	583,605
1926	700,376
1927	681,101
1928	1,042,592
1929	870,958
1930	809,281

thetic camphor were 4,000,000 pounds in 1929, but these fell to 2,400,000 in 1930 undoubtedly due to depressed business conditions. It is apparent that the future of the synthetic camphor industry is dependent upon tariff protection. At present camphor is on the free list.

Of particular importance is research to develop and introduce new chemicals, byproducts of the naval stores industry. Such work will reduce production costs and permit profits where in the past they have often failed to materialize. The chemical industry is already familiar with abietic acid, ethyl abietate, alpha terpenol, borneol, and several others. Yet these are but a few of the possibilities. Under the leadership of the larger companies research and close control of operations is taking the place of the ignorance and loose production methods that were satisfactory enough in the last century, but are antiquated today.



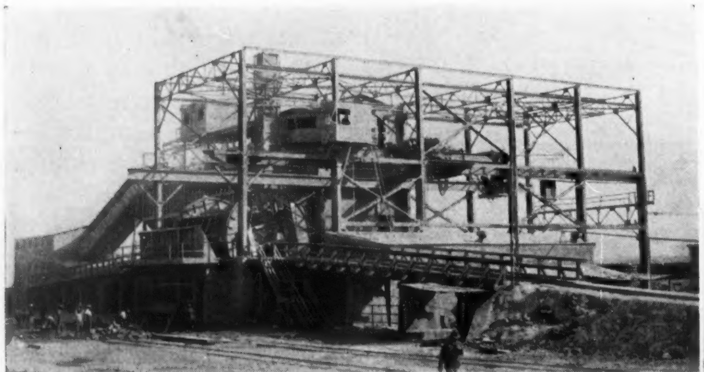
Keystone

Farm Board relief can only bring temporary relief to the stricken naval stores industry. What is needed is a concentration of manufacturing operations into fewer hands and the substitution of scientific methods for the obsolete processes still so prevalent

*Gambles Naval Stores Year Book 1931-32.

The Guggenheim Process at

In the past year the Chilean nitrate industry has consolidated its lines in two directions—a financial reorganization and an alliance of most of the producers into one strong company, the so-called "Cosach," and the adoption of the improved Guggenheim process of refining. The net result has been a more determined front against the synthetic producers of nitrates. Mining operations have been completely mechanized. Even the power transmission lines and railroad tracks are moved mechanically following the power shovels as they load the crude "Caliche" on to cars which convey it to the primary crushing plant



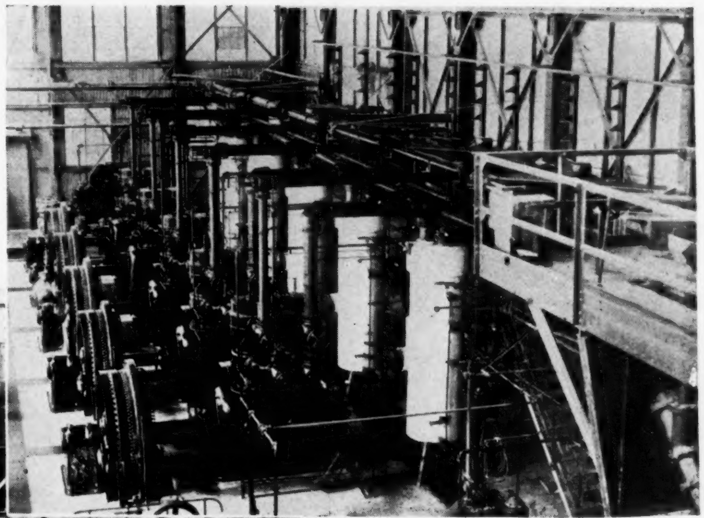
Each tank has a capacity of 7,500 tons. Strong mother liquor, originating from the filter-plant filtrate, is heated by a series of heat interchangers, the heat being recovered from the waste heat from the Diesel engine exhaust from the power plant. Crystalization by means of mechanical refrigeration is one of the most important points of difference between the Guggenheim and Shanks Processes. Part of the refrigeration equipment can be seen in the left of the leeching tanks

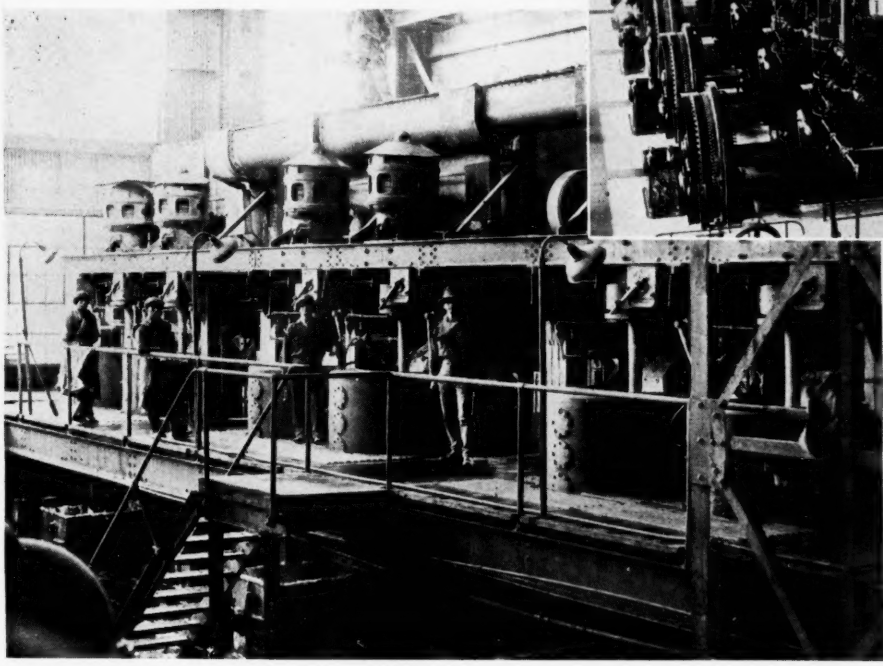
In the primary crusher (above) the run-of-mine ore is dumped by a rotary tipple into a hopper from which the large pan feeder draws. The feeder discharges over a cleaning grizzly into a Blake type jaw crusher. This is followed by two further crushings which reduce the final product down to 5/8 inch size. By means of a unique mechanical loading bridge (center background of photograph to the right) the material is conveyed to the large leeching tanks

Photographs courtesy Compania Salitrera Anglo-Chilera

Work in Chile

An Inspection Trip through the New Guggenheim, Maria Elena Chilean Nitrate Plant





Above, interior of the ammonia-compresser house. Crystallization is carried out by tube heat interchangers, the warm liquor being pumped contrarywise to the depleted. The final stages are conducted in shell and tube refrigerators. Dorr thickeners are used to thicken the sluge of nitrate crystals

The final manufacturing stages consist of briquetting and melting in a direct reverbatory furnace the molten nitrate and spraying through nozzles. This is done in the graining plant and the chilled nitrate is conveyed either to bulk storage or bagged automatically. The Guggenheim Plant in operation is called "Maria Elena" and ships its tonnage (demonstrated at 600,000 tons annually) from the port of Tocopilla shown below. The bagged nitrate must be still lightered to ships side, but harbor improvements will eliminate this extra handling. A plant similar to the "Maria Elena" is now under construction

New Applications of Ammonia

Great strides have been affected in the past two or three years in widening considerably the industrial uses of ammonia. Even the past twelve months period has witnessed many new applications. M. H. Merriss has filled a very necessary void in the literature, summarizing briefly the outstanding achievements of the workers in this important branch of industrial chemistry.

By M. H. Merriss*

THE first large scale American synthetic ammonia plant was constructed by the Allied Chemical and Dye Corporation at Syracuse in 1921; the second by Lazote, Inc. (now the duPont Ammonia Corporation), in 1926 near Charleston, West Virginia. There are now seven plants in operation and one under construction. The recent extremely rapid increase in the rate of synthetic ammonia production is best shown by reference to the chart (Figure 1). Expressed in quantity of ammonia,

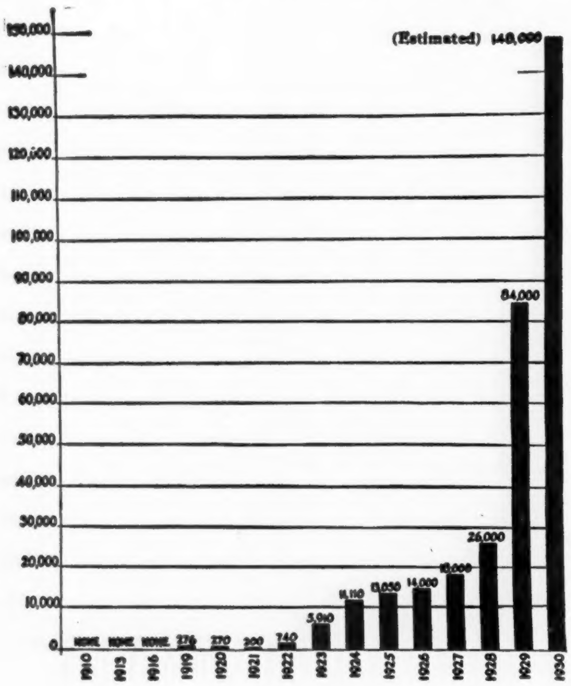


Figure 1

production for the three years ending with 1930 is about as follows:

1928— 33,000 tons anhydrous NH_3
1929—120,000 " " "
1930—179,000 " " "

*du Pont Ammonia Corporation
Reprinted from the 18th Annual Report, Compressed Gas Mfrs. Association

For 1931 the total capacity of American synthetic ammonia plants is estimated at 352,000 tons NH_3, or about 1,000 tons per day.

In 1929 the United States was ninth among nations as a producer of synthetic nitrogen, while in 1931 it will be second. The total investment in synthetic ammonia plants in the United States is now estimated at $70,000,000. So much for the strides by which ammonia production has advanced, and for the speed with which this nation has attained its high rank among fixed nitrogen producers.

Consumption

It is natural to wonder who is going to use all this ammonia. The increased consumption will result from the normal expansion of the country, from a progressive development of new uses for the chemical, and principally from the increasing use of domestic nitrogen for the manufacture of fertilizers, especially synthetic sodium nitrate, and for ammoniation of superphosphate. At present about 72.5% of the synthetic nitrogen of the country is employed in agriculture. The present annual consumption of nitrogen for other than fertilizer purposes is approximately: 17% Explosives, 12% Refrigeration, 20% Miscellaneous, 51% Chemicals and acids. The second chart (Figure 2) presents the above data graphically.

Explosives and refrigeration may be expected to continue to expand steadily but slowly; it is in the other three fields, chemicals, acids, and miscellaneous uses, that the present producer of ammonia must concentrate his efforts to utilize excess production.

Rapid decrease in ammonia prices, as shown in Figure 3, together with present availability of pure anhydrous ammonia in tank car lots at prevailing low prices, are materially widening ammonia's field for chemical usage.

The purpose of this paper is to tell of some of the new uses, with special reference to the production of hydrogen by dissociation or "cracking" of ammonia. The best way to do this is to list a few of the numerous fields which are now being rapidly exploited. Ammonia is revealed as a many-sided chemical, for this brief tabulation mentions its use as an alkali, a fuel, a reducing agent, a source of an acid, a fertilizer material, and a means of preparing foods, treating rubber, and purifying drinking water. The great variety of applications is at once apparent.

Distribution of Ammonia

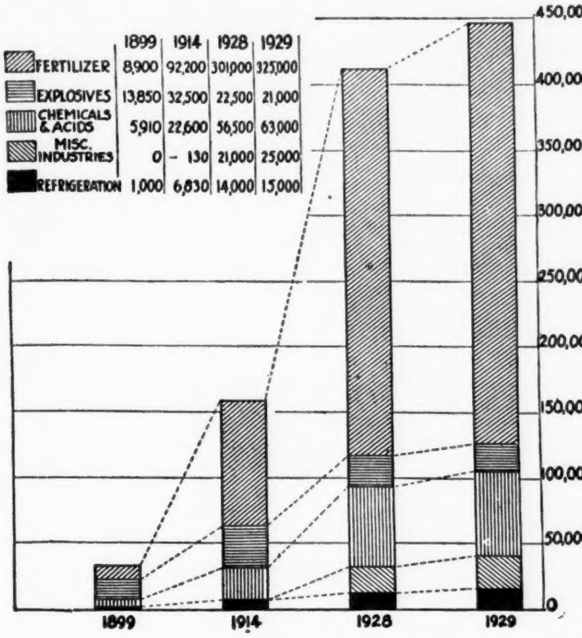


Figure 2

A. The ammoniation of superphosphate.
B. Production of nitric acid.
C. Nitriding.
D. Vulcanization of rubber.
E. Anti-corrosion agent in oil refining.
F. Leaching of metallurgical residues.
G. Ammonia-chlorine treatment of water for:
  - (a) municipal supplies
  - (b) swimming pools
  - (c) washing of foods and food containers
  - (d) slime removal in paper-pulping
  - (e) condenser water in power systems
  - (f) sterilizing purposes—hospital uses

H. Source of hydrogen and nitrogen for:
  - (a) welding { torch / atomic arc / shielded arc
  - (b) cutting
  - (c) bright annealing
  - (d) lead burning
  - (e) hydrogenation
  - (f) lighter-than-air craft
  - (g) reducing agent for molybdenum and tungsten production
  - (h) glass and quartz working
  - (i) brazing furnaces
  - (j) cooling of electric generators and condensers
  - (k) melting and working of platinum
  - (l) sulphur removal from coke
  - (m) inert atmosphere for chemical reactions
  - (n) nitrogen atmosphere employed in food canning

Present interest lies chiefly in the last two of the above applications, which have accordingly been subdivided and which I now take up in more detail.

Ammonia-Chlorine Treatment of Water

The use of ammonia and chlorine for water treatment is growing rapidly. Less than a year ago there were five groups employing this treatment; today over one hundred are in existence and the number is rapidly increasing. Apparently the combination of these two gases constitutes not only an ideal sterilizing agent for drinking and swimming water, but serves also as an effective means of eliminating tastes and odors. Medicinal and chlorinous tastes as well as the irritant action of the chlorine in swimming pools are absent when pre-ammoniation of the water is practiced.

The ammonia-chlorine treatment is showing wide industrial application in preventing algal and slime growths not only in swimming pools and city water mains, but in condenser waters for power plants. The prevention of the slime-coating of the surfaces exposed to the cooling waters allows the condensers to operate at improved efficiency for longer periods of time and reduces the frequency of shutdowns for cleaning.

The ammonia-chlorine treatment is finding application in the wash waters employed in the preparation and packaging of foods and in the cleaning of food containers such as milk bottles and cans. It is also being used to prevent slime growth in pulp and ground wood manufacture, where the ammonia-chlorine, by sterilizing the "white" water in closed systems, makes possible the production of a whiter news-print paper, and prevents other operating difficulties.

At first glance it might appear to be a matter of some concern to chlorine manufacturers that ammonia in many of the above applications, especially in the treatment of municipal drinking water, reduces the amount of chlorine that it is necessary to use. In such cases, however, more satisfactory industrial application is the result. It is my opinion, and I have good reason to believe that it is shared by those best versed in the chlorine industry, that the increased use and wider application of the combined ammonia and chlorine treatment, due to the more satisfactory nature of the results, will more than compensate for possible decreased chlorine consumption in a number of individual applications.

Ammonia as a Source of Hydrogen and Nitrogen

Conversion or cracking of ammonia to its constituent gases is a new industrial development that has become important in a remarkably short period of time. It is therefore of particular importance and interest to distributors of industrial gases.

When ammonia is passed over suitable heated catalysts which we have developed, it is dissociated or "cracked" into a gas containing exactly 75% hydrogen and 25% nitrogen by volume. One hundred pounds of anhydrous liquid ammonia, the contents of one standard cylinder, yield 4,500 cubic feet of gas containing 3,400 cubic feet of hydrogen, the equivalent of that contained in 17 cylinders of hydrogen. This gas, dissociated ammonia, can be burned in a properly designed combustion furnace with the required amount of air to yield nitrogen. One hundred pounds of ammonia thus dissociated and burned will yield 7,800 cubic feet of nitrogen, the equivalent of that contained in 39 cylinders of nitrogen.

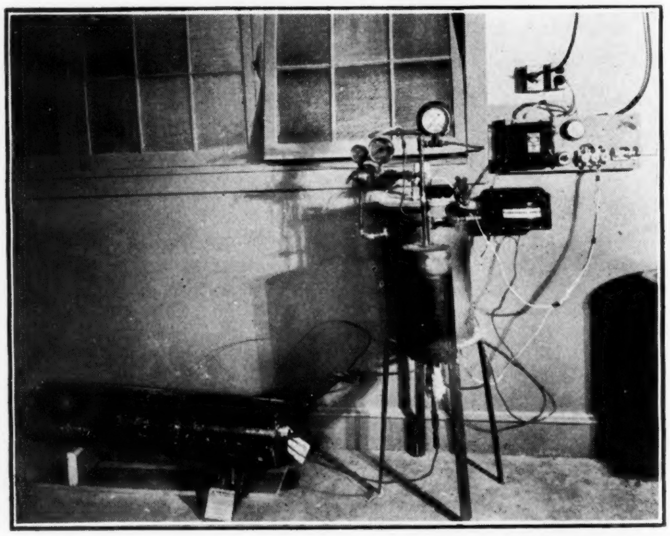
The apparatus for dissociating or "cracking" ammonia, which has been developed in the Research Laboratories of the duPont Ammonia Corporation, is compact, inexpensive, portable, automatic, and operates at low cost. No special technique or training is required in its operation. There are no moving parts involved, and the entire apparatus is quite small. The cracker itself, when assembled with Sil-O-Cel insulation, is about three feet in length by one foot in diameter. Such a machine will produce at least 600 cubic feet of dissociated gases per hour. Its compactness may be noted from the photograph (Figure 4). Details of the design, construction, and operation of this apparatus are fully described in a paper, "Ammonia as a Source of Hydrogen and Nitrogen," presented at the December, 1930, meeting of the American Institute of Chemical Engineers by Drs. Berliner and Burke of our technical staff. Licenses are available under duPont Ammonia Corporation patent rights, which fully cover both the apparatus and catalysts.

Original cost is very low, less than $150 being required to construct a cracker capable of delivering 500 cubic feet of hydrogen per hour at standard conditions of temperature and pressure. Control instruments, such as regulating valves, controlling pyrometer, contactor, etc., come to an additional $250, making a total overall cost of under $400. These figures, which should be materially reduced by quantity production in properly equipped machine shops or electrical instrument factories, are presented to indicate the cheapness of the apparatus and the relatively small capital charges involved. Five hundred cubic feet of hydrogen per hour, or say twenty cylinders per eight-hour day, represents quite a hydrogen account, but a user of this amount or less, for under $500, can now equip himself for his own production. Many a manufacturer who would hesitate for some time before going into the design and construction of proper electrolytic gas manufacturing apparatus, will seriously consider setting up such a cheap and effective means of producing his own hydrogen or nitrogen, or the particular reducing or inert atmosphere he is using. This is discussed more fully below.

It may at first appear paradoxical that low cost hydrogen can be obtained through the circuitous route of synthesizing ammonia from manufactured hydrogen and subsequently dissociating this ammonia to obtain the hydrogen. It should be noted that for extremely large demands, such as hydrogenation of petroleum, this method of obtaining hydrogen is not economic. However, this is not the case for relatively smaller hydrogen requirements. The cost of hydrogen manufactured for use in the large scale production of synthetic ammonia is extremely low compared to the cost of commercial hydrogen supplied in cylinders. Ammonia is transported as a liquid which contains a high concentration of available hydrogen. Whereas in the case of hydrogen about one pound of commodity is transported in 130 lbs. of cylinder, in the case of ammonia 100 lbs. (17.6 lbs. hydrogen) is transported in 165 lbs. of cylinder. This means of veritably transporting liquefied or "stored" hydrogen presents a method for obtaining the gas at a material reduction in cost compared to the present cost of commercial hydrogen. It is obvious that cracking by the industrial user eliminates all cylinder costs and high compression charges, as well as shipping, handling, storage, and distribution items.

Price Statistics Compared

The present average domestic price of liquid anhydrous ammonia in standard size tank cars and cylinders is respectively about 6 cents and 16 cents per pound, delivered. The cost of operation of the dissociator is



The New Ammonia "Cracker" is an important step in reduction of costs

low. A liberal estimate of all charges upon the equipment and its operation is about one cent per pound of ammonia dissociated. The total cost for dissociated ammonia is therefore about $1.50 per thousand cubic feet when purchased in tank cars or $3.75 when ammonia is purchased in cylinders. The actual cost of the hydrogen present is on this basis about $2.00 per thousand cubic feet and $5.00 per thousand cubic

feet, respectively. Against this, the present average cost of commercial hydrogen in cylinders is around $10.00 per thousand cubic feet. In other words, the use of ammonia from cylinders as a source of hydrogen results in a saving of about 50 per cent as compared with the cost of commercial hydrogen obtained in cylinders, and a saving of about 80 per cent is realized when the ammonia is purchased in tank cars.

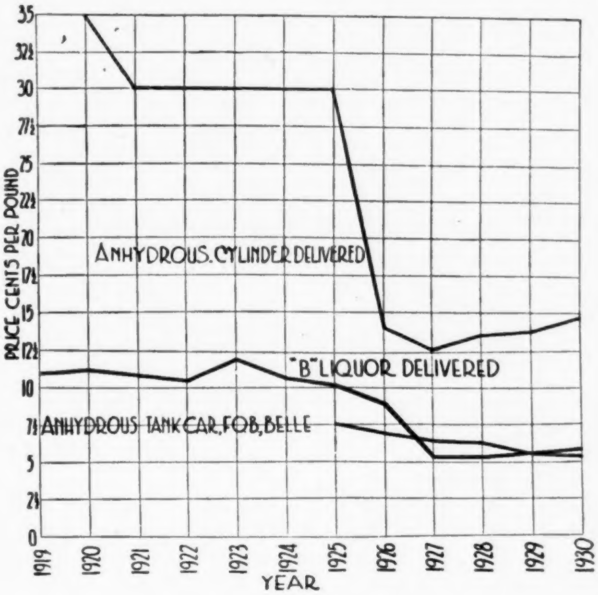


Figure 3

In cases where a semi-inert atmosphere is desired, and the cracked ammonia, or "mixed-gas," can be substituted directly for hydrogen, these savings are increased to about 60 per cent for cylinder ammonia and 85 per cent for tank car ammonia. To these savings should be added the economies incident to materially lower handling and labor charges. Considering hydrogen content alone (the most unfavorable basis for comparison with ammonia), the awkward amnipulation of sixteen cylinders through the user's factory is eliminated, together with the work of connecting them up to pipe lines, disconnecting, handling of empties, etc.

The cost of nitrogen, allowing for cost of dissociation and burning, is about $2.00 per thousand cubic feet, based on the price of ammonia in cylinders, and $1.00 per thousand cubic feet, based on tank car quantities of ammonia.

The present average cost of a cylinder of nitrogen is about $2.20, equivalent to about $11.00 per thousand cubic feet. The use of nitrogen derived from ammonia by the above method will result in an 80 per cent reduction in the present cost of nitrogen, based on cylinder ammonia prices (90 per cent on tank car prices). The economies which will result from 97 per cent reduction of cylinder handling charges by the substitution of one cylinder of ammonia for 39 cylinders of nitrogen are obviously very large.

The question that one immediately asks is—can dissociated ammonia be substituted for hydrogen in all applications?

The answer is that cracked ammonia may be successfully substituted for hydrogen in a large majority of uses. In many instances it has a definite technical advantage over hydrogen, while in some cases hydrogen is superior or essential. Extended discussion of comparisons for all uses is impossible within the time allotted, but brief statements can be made regarding some of the specific applications which are of greatest interest to this group.

Welding Applications

Work done under the supervision of Dr. W. M. Dunlap in the Aluminum Research Laboratories of the Aluminum Company of America has revealed that thinner aluminum sheets can be welded with oxy-cracked ammonia than is practicable with the oxy-hydrogen torch. Welding of thin sheets of this metal is, in general, superior to straight oxy-hydrogen work, while for thicker sheets the two gases are equally effective. Dissociated ammonia can advantageously replace hydrogen in such uses as bright annealing of copper and steel, as a reducing atmosphere in brazing furnaces, and in the reduction of tungsten and molybdenum oxides, as well as in the subsequent working of the metals thereby produced. There are a number of chemical reactions that require an inert atmosphere for their successful completion. Dissociated ammonia has technical as well as economic advantages in this field. For many of the modern annealing furnaces and processes, an atmosphere is desired which is inert enough to eliminate all danger of explosion and yet reducing enough to eliminate all danger of oxidation. For such purposes, cracked ammonia, burned with air to obtain whatever nitrogen percentage is desired for the specific application, is ideal.

Experimentation is active at the present time in testing the comparative efficiency of the new mixed gases for cutting and welding with oxygen, for lead burning, and for glass and quartz work. In some of these fields very satisfactory results are indicated, whereas in others the present medium may retain its position in spite of the cheapness of the cracked ammonia. In the atomic hydrogen arc welding process developed by the General Electric Company, dissociated ammonia furnishes a much more economic fuel and minimizes the warping of metal sheets during welding, by better localizing the area heated for the welding operation. These advantages more than overcome the slightly higher tungsten consumption and slightly lower welding speed which some operators have reported, usually before becoming thoroughly familiar with manipulations in the new gaseous atmosphere and the necessary adjustments involved.

In processes where there is a recycling of gas, such as some methods for hydrogenation of edible oils and fats, residual nitrogen content of circulation gases rapidly builds up, slowing down the reaction and

requiring more frequent purging. In such cases essentially pure hydrogen will hold its place unless the cheapness of the cracked ammonia substitute more than offsets the hydrogen loss due to nitrogen purging.

Production of Compressed Cracked Ammonia

The low initial cost, simplicity, and reliability of operation of ammonia crackers is such that it is not going to require much urging to persuade the moderately large industrial user of hydrogen, nitrogen, or mixtures thereof, to install cracking apparatus and produce for himself. His cost reduction, based on present prices of hydrogen and nitrogen, will be of the order of about 50 per cent and 80 per cent, respectively. On the other hand, there will be in any of our great industrial centers large numbers of small consumers whose cylinder requirements, while indicating that the cost of the cracker can be returned in a year or less, are small enough to make them feel that it is not worthwhile to bother with the installation of a new piece of apparatus. There is an excellent field open to the present manufacturers of compressed industrial gases, for the compression and distribution—to these smaller users—of mixed gases produced by cracking cheap ammonia in tank car lots. Such companies, having the foresight and the capital to provide ammonia storage facilities, obtain an advantage of about 60c per cylinder over the industrial cracker operator, who must in general purchase cylinder ammonia. The cost of producing mixed gases from ammonia should be lower than the cost of producing pure hydrogen on a small scale by electrolysis in the average location, when proper allowance is made for depreciation and capital return. Because of the lightness of the product, hydrogen cannot be economically transported for very long distances. This definitely prevents erection, even in the most favorable locations, of single, very large, centralized, cheaply operated plants—electrolytic, water gas, or steam and iron—for wide radius distribution. With the scattered, small comparatively inefficient units to which such economics necessarily restrict the present producers, similarly scattered cracked ammonia units can effectively compete. All in all, this would seem to be a real field for progressive compressed gas manufacturers, especially for concerns which are not at present operating hydrogen installations in our most crowded industrial centers.

Canadian Tungsten Mining Operations

The recent discovery by Dr. Colin G. Fink, professor of chemical engineering at Columbia University of a means of making tungsten plate through a new electro plating process has resulted in the revival of tungsten mining operations at the Indian Path Mines Lunenburg, N. S. The mining of tungsten in Nova Scotia has hitherto been found unprofitable but in view of the extensive demand which the new discovery is creating active development work is now being undertaken on a large scale. Two shafts have been sunk and the ore bearing tungsten has been proven for a depth of 70 feet.

Foreign News

Foreign producers of several of the baser metals have arraigned through agreements to further restriction of output with the hope that such action would raise prices, decrease present excess stocks and generally stabilize the world markets in tin, lead, and zinc. At a meeting held in June, at Brussels, representatives of zinc producers from Belgium, Germany, Poland and France agreed to draw up a plan calling for a restriction of approximately 45 per cent of present production. At the conference started July 13, also in Brussels, the same representatives debated these terms. To date (July 24) the cartel had not succeeded in coming to final terms, but reports from abroad suggest the strong possibility that the original agreement would be ratified.

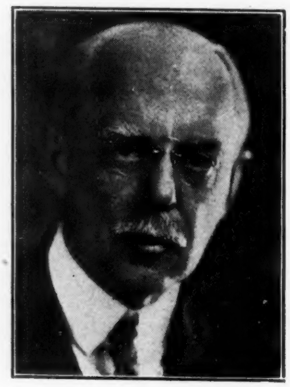
July also witnessed the entrance of Siam into the tin curtailment plan and this important factor brings the total participants to 92 per cent of the world production. Siam's quota, effective September 1, is placed at not less than 10,000 tons annually.

Net reduction of world output resulting from Siam's adherence results in an amount approximating 3,000 tons. World production under control now totals 115,844 tons. Estimated uncontrolled production is 6,156 tons.

Finally, the cartel of foreign producers of lead has agreed upon 5 per cent additional reduction in lead production, effective as of July 1. This is in addition to the 15 per cent agreed to earlier this year. It is thought that a cut of 20 per cent will bring actual production below present needs and aid in gradually eliminating present world surplus stocks.

Chief interest in foreign news, aside from the break in the nitrogen negotiations (See page 177 News Section) centered in London where the British Chemical Exposition was opened on July 13, by Sir Harry McGowan, (Chemical Markets News Reel) and the jubilee of the Society of Chemical Industry of which McGowan is President, having succeeded the late Lord Melchett to this post as well as to the Chairmanship of the Imperial Chemical Industries.

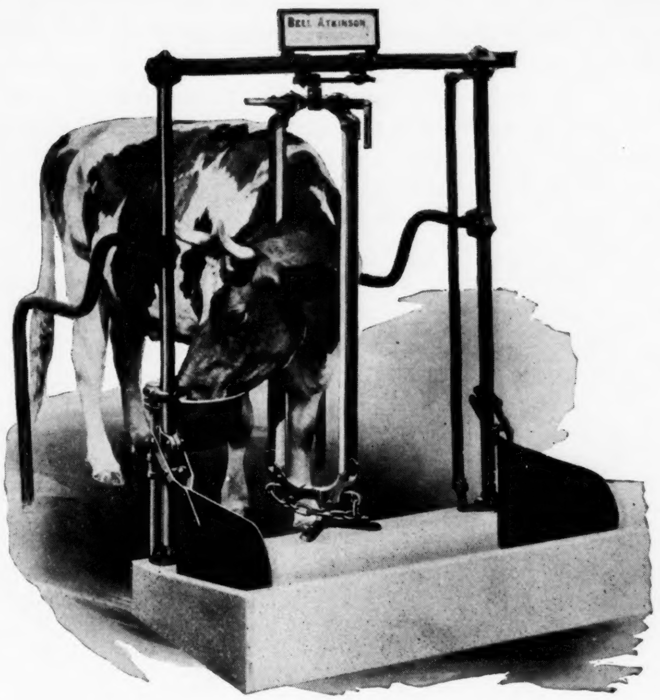
The Society of Chemical Industry has a glorious history in its fifty years of existance. In 1881 several of the leading chemists came to the decision that the then existing local scientific societies were duplicating each other's efforts and the most desirable plan was to amalgamate these into one strong national union.



Arthur D. Little, last American to serve as President, 1928-1929

Accordingly, under the chairmanship of Sir Henry Enfield Roscoe, who later became the Society's first president, a meeting was held by representatives of the Newcastle Chemical Society and the Faraday Club, together with a number of other prominent men of the chemical industry. A list of the vice-presidents elected contains such names as Perkin, Siemens, Dr. Angus Smith and Musspratt. The then Ludwig Mond (the late Lord Melchett) was active in the formation of the Society. The first general meeting was held in London on June 28 and 29, 1831, when it was decided to set up local sections.

In 1894, an American Section was formed under the chairmanship of Alfred Mason. This Section has flourished since its inception and has provided no fewer than five Presidents of the Society, 1899-1900, C. F. Chandler; 1904-1905, William H. Nichols; 1909-1910, Prof. Ira Remson; 1912-1913, Prof. Marston T. Bogart; 1928-1929, Arthur D. Little. The American Section has been hosts in New York at the Society's meetings in 1904, 1912 and 1928. The present enrollment on this side of the Atlantic now totals 600 members.



A Milk By-Product in Chemical Fields

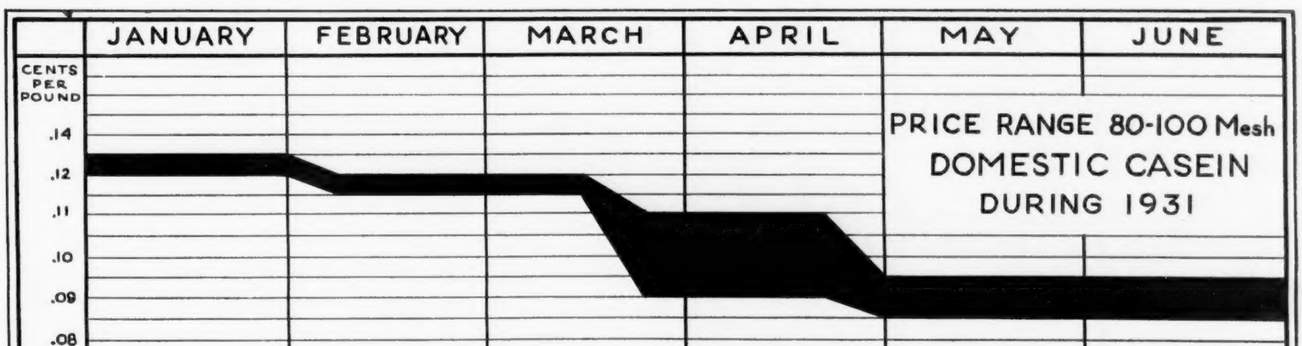
Every factor in the casein market—price, tariff rate, production, imports, consumption—have been upset during the past eighteen months, with the result that competitive chaos surrounds the development of a rapidly growing chemical-agricultural by-product industry.

CASEIN production in the United States is expanding. Ten years ago our imports furnished two-thirds of our requirements: in 1929 they supplied less than half. Preliminary figures for 1930 point to a domestic production of 24,000,000 pounds and imports of 18,000,000 pounds, indicating a further decline in imports, when compared with total consumption. Imports during the first quarter of 1931 amounting to 1,574,996 pounds compared with 7,177,730 pounds during the same period a year ago.

The growth in the casein industry in the United States is directly traceable to a change in viewpoint. Formerly the preparation of casein was considered a necessary evil, but producers are now looking upon it as an industry worthy of thought and attention. Naturally, however, it is still classified as a by-product and its output is dependent upon the ebb and flow in the demand for other milk products.

Generally speaking, casein is made in the United States by the addition of a weak acid, in France through rennet precipitation, and in the Argentine by natural souring. The result of manufacturing by these three different methods is widely differing physical and chemical properties. Consequently, certain preferences and prejudices enter strongly into the marketing of casein. This is evident in the prices of casein, foreign material usually carrying a premium. For example, the prices, as this is written, are as follows: Domestic, 80-100 mesh 8½ to 9½ cents; Argentine, 9½ to 10½ cents; French, 13 to 13½ cents.

The largest single use of casein in the United States is in the manufacture of coated paper, approximately three quarters of the total consumption going into this field. From ten to fifteen per cent is employed in the making of water proofed glues and the remainder in textiles, plastics, waterproof paints, insecticide spreaders, and diabetic foods. Growth of both con-



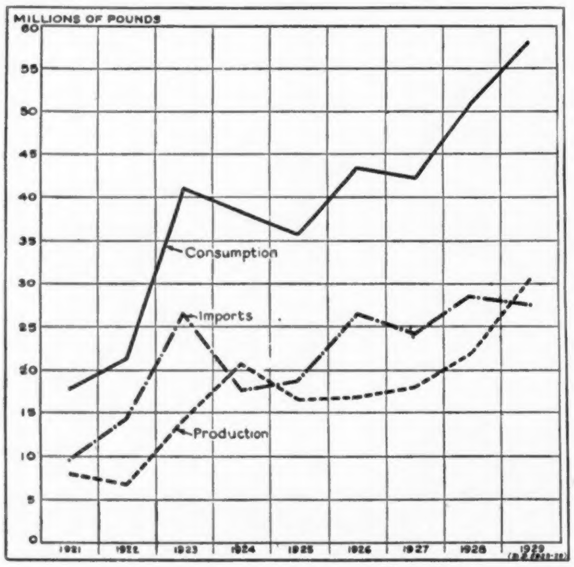
sumption and production in this country in the past ten years is directly the result of the greater use in coated stock and the introduction of a few new uses.

Casein Imports

Country of origin	1928		1929		1930	
	Pounds	Value	Pounds	Value	Pounds	Value
Argentina	23,138,945	$2,950,796	22,799,885	$2,697,546	17,209,087	$1,769,655
France	1,905,700	247,760	3,196,936	415,517	767,436	88,080
Germany	2,196,194	292,248	1,181,370	157,335	286,906	36,927
Canada	237,352	32,782	182,218	25,333	163,473	15,981
United Kingdom	100,113	12,764	165,105	20,040	26,579	3,226
New Zealand	198,464	29,210	11,760	1,572		
Netherlands	555,061	72,820	11,020	1,340		
Denmark	239,705	30,966	2,246	418		
Other countries	79,681	8,595	32,799	4,029	46,175	6,029
Total	28,651,215	3,677,941	27,583,339	3,323,130	18,499,656	1,919,898

U. S. Commerce Reports

The price of casein has shown wide variation in the past decade. It would be more nearly correct to say prices rather than the price. The years 1920 and 1921 saw the normal deflation from the high prices of the war period when foreign material was difficult to obtain. The following two years, 1922 and 1923, the latter especially, witnessed a sharp increase in prices. If the chart of casein consumption is consulted it is seen that consumption in these two years jumped tremendously. The last part of 1923, 1924 and part of 1925 saw a drop in consumption and a rather severe weakening of prices in 1924. Prices again assumed an upward trend in 1925 as the consumption again increased in 1925 and part of 1926. A very slight drop in the use of casein was registered in the last half of 1926 and the first half of 1927 but it was so slight as not to effect prices materially. The last half of 1927 witnessed a renewal in the growth of consumption with prices off slightly from the high of 1927, but held firm in a range of 14½ to 16 cents. In the latter part of 1930 prices again sagged due to curtailed consumption brought about by a major business depression.

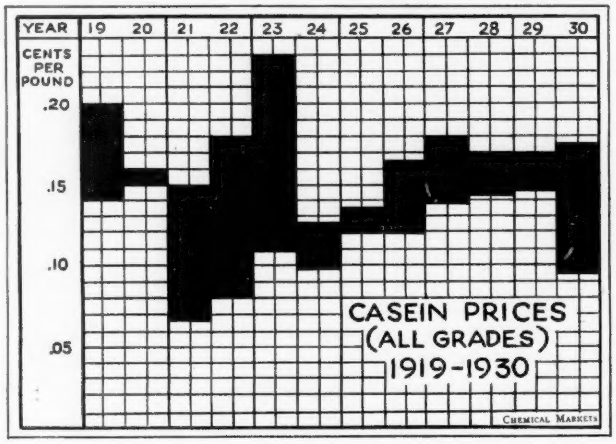


U. S. Commerce Reports

One of the worst sufferers in the present situation has been the paper industry. As casein consumption is greatest in this industry it is only natural that consumption and prices have dropped at a rate even greater than that prevailing for most other industries.

In the past six months the price of 80- to 100-mesh domestic grade has dropped from 12 to 13 cents down to 8½ to 9½ cents, a decrease of approximately 30 per cent. This is a drastic drop, but casein prices held at stable levels longer during 1930 than did chemicals generally.

The change in tariff duty which became effective on June 17, 1930 has undoubtedly influenced the importation of casein. The rate on that date was changed from 2½ cents to 5½ cents. At the present market price it is questionable whether it is profitable to bring in



Argentine casein and sell it for 9½ cents. It is significant that perhaps the greatest reason why casein prices did not decline as rapidly in 1930 as other industrial chemicals was the large increase in the tariff duty. In the last few months of 1922 and in 1923 it is worth noting that prices were increased when the 2½ cent rate became effective. Due to the present depression, the benefits to American producers of the increase in the tariff rate have been largely nullified, although by holding but foreign material during the first quarter of 1931 it has prevented imports from entering into as severe competition with domestic as otherwise would have been the case.

It will be necessary to wait normal times to determine the final effect of the tariff increase on the price and consumption of casein. Like many other commodities casein prices are in all probability unduly depressed and with the turn of business the increase in consumption will stimulate and raise prices more nearly in line with the 1927-1929 levels. This may serve to stimulate a renewal of importations. Protection for the American casein industry is a delicate and debatable question. Where consumers of casein are using foreign material for nearly half of their total requirements, it is but natural that they are specially active in working towards lower tariff rates. Our manufacture of casein being in its final analysis a by-product production, the question of manufacturing costs becomes a question of from which side of the fence the figures originate. At the present moment the casein industry is in a difficult position.

What Are Chemical Securities Worth?

A Financial Analysis

By F. A. Hessel

STOCKHOLDERS have been thinking a great deal during these dark days about dividends and earnings and their thoughts have not all been happy ones. They might have been less depressed if they had paid more attention to the financial situation of the companies in which they were interested, especially if they were holders of certain chemical stocks. For the securities of those corporations which are firmly entrenched financially, stand a good chance of being able to profit by the first upturn in business.

It is perfectly true that the trend of security prices over a long period is probably mainly influenced by actual and prospective earnings, but current financial position and property value, never minor considerations, become especially important during an abnormal period when earnings are influenced by extraordinary conditions. At such a time financial strength which is often taken for granted in prosperity becomes a matter of grave importance. A company whose current assets show a satisfactory ratio to its current liabilities has comparatively little to fear, when its earning capacity is temporarily reduced. If, on the other hand, the balance sheet shows an unsatisfactory position, good potential earnings may come so late as to cause heavy sacrifices to the stockholders.

Comparison With Other Industries

It is for this reason that we have thought it worth while to make an analysis of the financial position of a number of representative chemical companies, and for the purpose of comparison we have included in all our tables, figures relating to four other major industrial corporations. As a basis on which to classify these various companies, we have calculated their market value as of June 1, 1931, as shown in Table I.

Following the order thus established in Table No. 1, we show the financial status of these companies as of December 31, 1931, the latest date on which complete statements were issued. We have computed the ratio of current assets to current liabilities and the percentage of cash and marketable securities and inventory to current assets. The last point is particularly important because in many cases inventories may not easily be converted into cash.

Chemical Companies Firmly Entrenched

The immediate conclusion to be drawn from these figures is that practically all the corporations listed appear to be in a very comfortable financial position, and are thus well able to bear the full weight of the current depression. In order to demonstrate just what the financial strength of these companies means to the holders of common stock, we have made some calculations given in Table No. 3, which show the working capital, senior securities, plants and properties, patents, etc. on a per share basis. We have also included in this Table the book-value per share of common stock (excluding intangibles) and market price as of June 1, 1931.

TABLE I

Company	*Market Value as of 7/1/31-x* (000,000 *omitted*)	*Company*	*Market Value as of 7/1/31-x* (000,000 *omitted*)
Du Pont	1.123	Mathieson	17
Union Carbide	499	U. S. Ind. Alcohol	12
Eastman Kodak	347	Monsanto	12
Allied Chemical	347	Westvaco Chlorine	10
Texas Gulf	96	Newport	10
Air Reduction	71	Tennessee	9
Hercules Powder	41	Am. Comm. Alcohol	3
Columbia Carbon	40	General Motors	1.856
Commercial Solvents	37	U. S. Steel	1.528
Freeport Texas	21	General Electric	1.341
Atlas Powder	19	Standard Oil N. J.	1.164

NOTE: x-Market value has been calculated based on total capitalization outstanding on December 31, 1930, and adjusted to the nearest 1,000,000.

Table II

Company	Current Assets as of Dec. 31, 1930	Cash & Mkt. Securities as at Dec. 31, 1930	% Cash & Mkt. Securities to Current Assets	Inventory as of Dec. 31, 1930	% Inventory Current Assets	Current Liabilities as of Dec. 31, 1930	Ratio Current Liabilities to Current Assets
DuPont	$124,043,698x	$62,515,912x	50.4	$39,457,080	31.8	$13,244,649	9.4
Un. Carbide	110,231,628	48,110,278	43.6	44,376,474	40.2	14,354,274	7.8
Eastman Kod.	86,559,183	36,159,044	41.8	35,960,728	41.5	13,415,572	6.4
Allied Chem.	155,451,336	113,320,484	72.9	28,733,695	18.5	8,715,055	17.8
Texas Gulf	19,447,549	5,488,051	28.2	11,928,749	61.3	5,934,845	3.3
Air Reduction	18,500,596	6,475,772	35.0	1,877,185	10.1	1,085,661	17.
Hercules Powder	18,276,544	7,343,169	46.2	5,927,289	32.4	717,407	25.5
Col. Carbon	11,115,988	4,598,414	41.4	2,848,678	25.6	911,367	12.4
Com'l Solvents	8,902,367	5,874,246	66.0	2,549,044	28.6	806,428	11.
Freeport Texas	10,137,840	3,431,763	33.8	5,251,466	51.8	4,667,727	2.2
Atlas Powder	11,466,642	4,390,945	38.1	3,065,410	26.7	787,989	14.5
Mathieson	3,284,172	1,120,741	34.1	1,461,958	44.5	1,088,146	3.
U. S. Ind. Alco.	13,506,902	4,165,679	30.8	6,092,474	45.1	2,638,355	5.1
Monsanto	6,470,676	2,080,829	32.1	3,298,230	51.0	1,031,727	6.3
Westvaco Chl.	1,298,526	173,279	13.3	763,870	58.8	166,199	7.8
Newport	5,600,428	432,085	7.7	4,371,015	78.0	1,250,843	4.5
Tennessee	5,903,736	790,523	13.4	4,127,575	69.9	978,349	6.
Am. Com. Alcohol	2,657,272	337,762	12.7	1,466,232	55.2	293,577	9.1
General Motors	364,817,496	179,037,070	49.1	136,298,891	37.4	83,779,860	4.4
U. S. Steel	578,373,097	197,806,924	34.2	323,052,847	55.8	108,873,455	5.3
General Electric	242,564,549	141,717,851	58.4	60,063,418	24.8	40,603,451	6.4
Standard Oil, N. J.	730,986,691	225,826,289	30.9	282,729,574	38.7	$169,093,894	4.3

NOTE: x-Excluding General Motors investment which is not carried in the Balance Sheet as current assets.

Working capital is computed by subtracting current liabilities from current assets. It is important to know the amount of senior securities per share of common stock because in the case of liquidation, the former would, of course, have prior claim. The figures for plant and properties were taken after deducting the reserve for depreciation carried by each company.

The result of this calculation should be gratifying to stockholders of these corporations and prove that there are still encouraging items to be found on the balance sheet of well-run organizations. All of our figures should illustrate what we have said about the importance of financial stability in a period of uncertain business conditions.

A comparison of the financial status of chemical companies with that of leaders in other lines of business activity reveals that the former are more than holding their own. Indeed we believe we can safely state that as a whole, chemical companies are in a particularly strong financial position and give every evidence of being able to weather the storm and be ready to take advantage of the first signs of better times.

These statistics are all the more of pertinent value because this is only the second major business depression that the chemical industry has gone through since it gained its majority. It is, after all, only a reflection of the general public's confidence in the future of the chemical industry. The comparison is flattering to the industry and the executives guiding its destiny.

Table III

Company	Working Capital per Share of Common Stock as of Dec. 31, 1930	Senior Securities per Share of Common Stock as of Dec. 31, 1930	Plant and properties per Share of Common Stock as of Dec. 31, 1930	Patents Goodwill etc. per Share of Common	Book-value per Share of Common as of Dec. 31, 1930	Market Prices 7/1/31	Ratio Market Price to Book-value
Dupont	$10.01	$ 9.12	$17.18	$ 2.50	$36.30	90	2.5
Union Carbide	10.65	18.29	20.09	...	30.38	53	1.7
Eastman Kodak	32.35	2.72	35.27	...	65.26	150	2.3
Allied Chemical	64.60	17.18	44.59	9.31	92.83	130	1.4
Texas Gulf	5.32	....	6.50	....	12.42	38	3.1
Air Reduction	20.97	....	16.02	....	40.67	86	2.1
Hercules Powder	29.11	18.94	33.91	8.29	38.20	45	1.2
Columbian Carbon	20.47	....	35.89	....	55.07	81	1.5
Com'l Solvents	3.19	....	xx	....	3.89	15	3.9
Freeport Texas	7.49	....	5.15	....	14.01	28	2.
Atlas Powder	40.84	37.72	37.73	11.95	52.33	37	.71
Mathieson	3.37	3.80	25.33	....	27.81	22	.79
U. S. Ind. Alcohol	29.08	....	57.64	....	89.45	32	.36
Monsanto	12.68	4.78	21.61	....	29.59	24	.81
Westvaco Chlor	5.03	18.41	25.70	1.84	12.91	27	2.1
Newport	8.34	3.20	14.98	0.98	21.87	16	.73
Tennessee	5.74	3.74	18.84	....	20.81	7	.34
Am. Com. Alcohol	6.26	....	16.68	....	22.45	9	.40
General Motors	6.46	4.32	9.09	1.19	16.72	38	2.3
U. S. Steel	54.04	55.64	193.07	....	206.30	103	.5
General Electric	7.00	1.56	1.63	....	14.16	45	3.2
Stand. Oil N. J.	22.02	6.62	31.13	1.85	44.67	39	.87

NOTE: xx-Fixed assets of parent company are carried as of Dec. 31, 1930, at the nominal value of $1.

Soft Drinks

Calico Printing

and Electroplating

An Italian cartel and the development in this country of a fermentation process for the production of citric acid have forced this commodity into a highly competitive position.

CITRIC acid has dropped twenty-four per cent in price in the past seven months. The prevailing price up to the latter part of 1930 for the U.S.P. crystal grade, packed in barrels, was in the neighborhood of 46 cents, while on July 13, the leading producers announced a further reduction of one cent bringing the current level down to 35 cents.

While this is a radical decline in price, it is possible to point to other chemicals where similar reductions have occurred in the past eight or ten months. The conditions surrounding the present citric acid market are of particular interest, however, due to the relationship of the imported and domestic prices and the introduction of a synthetic process.

For many years Italy's place in the chemical industry was chiefly due to its position in the sulfur and citric acid fields. How she lost world leadership in the first of these two is well-known. Her position in the latter is now seriously threatened and from present indications to a great extent lost. The change in the world markets in citric acid serve but to prove once more the uncertainty of chemical manufacturing methods.

Prior to 1928 this country was almost entirely dependent upon outside sources for its supply of calcium citrate and also to a great extent for citric acid. In that year the leading producers in Italy reorganized their industry by forming a general sales organization known as the Consorzio Italiano Fabbriche Acido Citrica. Previous to this arrangement, the two largest Italian producers of citric acid were the Appula of Milan and the Arenella of Palermo. Under this agreement the factory of the Appula was closed for a period of fifteen years in return for a payment of 500, 000 lire from the cartel. By the same agreement distribution of calcium citrate was given to the Camera Agrumaria of Messina. This orgnization was bound by contract under government sanction to supply first, the two manufacturers of citric acid with lime citrate, before tonnages could be sold to foreign countries. This, of course, in reality gave the Italian citric acid manufacturers a strangle hold on world markets and spurred foreign manufacturers to look to synthetic means of production. Prices were forced up to artificial heights, 1928, 44½ to 59 cents; 1929, 46 to 70 cents. The present market price is just one-half of the peak of 1929. How effectively this monopoly of lime citrate supplies worked to increase the manufacture and sale of Italian Citric Acid is seen by a comparison of the figures for 1928 when production amounted to 7,412,052 pounds as compared with about 2,000,000 pounds in the pre-war period.

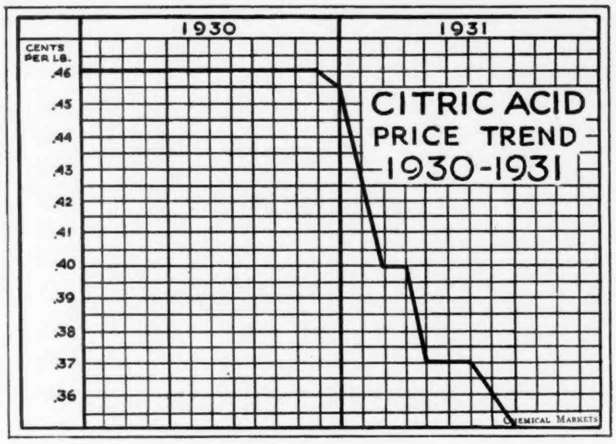
In this country steps were first taken as early as 1893 to use our citrus industry in California to supply our needs of citrate and citric acid. The project could hardly have been a pronounced success for several years, as production was carried on only intermittently. However, since 1916 operations have been continuous. Recourse has been had also to the pineapple industry of Hawaii and for several years approximately 100,000 pounds of 64 per cent lime citrate have been shipped to the mainland for conversion into citric acid.

Real relief from Italian domination dates back only to 1928 when the synthetic method was introduced in this country on a commercial basis. In this process refined cane sugar is inoculated with certain micro-organisms and the subsequent calcium citrate after fermentation and treatment with lime is reacted with sulfuric acid to produce citric acid. Efforts to date to produce the acid by direct fermentation processes have failed.

Syuthetic Versus The Natural

The instantaneous success of the synthetic process has reversed the position of this country. Where formerly we were importing, we are now exporting. For the first five months of the current year, 1,972,145 pounds of citrate valued at $252,682 were exported into Great Britain. In 1928 we exported into the British market 2,229,360 pounds and in 1929 supplied 4,375,840 pounds, while Italy had but 2,590,112 pounds. It is essential, however, in considering these figures to keep in mind that Italy has held a strict check on exports of the citrate in an effort to force foreign countries to purchase citric acid rather than the raw material from which the acid is made.

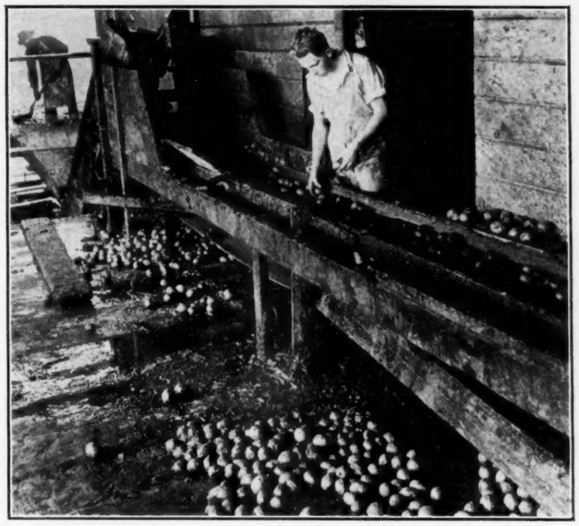
The competition offered by the new synthetic process in this country, in the United Kingdom, Czechoslovakia, and Belgium to the Italian cartel citric acid has resulted in a reduction of the citrate of lime prices from 700 lire per metric quintal at the beginning of the 1929-1930 season down to 400 lire at the close. This year the price on large quantities dropped again in half to 200 lire. Thus Italian producers of citric acid are now operating on raw material which costs less than a third of what it formerly did. It is small wonder then that Italian citric acid producers can enter into severe price reductions in an effort to obtain a larger portion of our domestic consumption. In spite of the radical drop in Italian prices of lime to the members of the C. I. F. A. C., stocks continue to pile up according to the latest figures released by the Camera Agrumaria at Messina. Stocks on hand March 15, 1931 amounted to 9,497,124 kilos an increase of 35 per cent from the stocks on hand November 30, only four months previous.



A graphical presentation of the effect on prices caused by foreign competition

It is fairly safe to say that the severity of the decline in citric acid prices in this country during the first six months of 1931 is due more to the effort of Italian

California has been a producer of citric acid since 1916, but production was limited. Photograph above shows the finished acid being transferred to the packing rooms



Inspecting fruit preparatory to its entrance into the digestors at the plant of the California Citrus Fruit Exchange

producers to increase shipments at the expense of domestic producers than to any curtailment in actual use because of present business conditions. Glancing back through the market reports for the past six or seven months reveals a story of sharp competition between imported and domestic with actual consumption being maintained at fairly satisfactory levels. The outlook for the immediate future appears to point towards a continuation of the present situation until the excess stocks in Italy are removed from the picture by increased consumption in foreign countries which are heavy buyers of Italian material or a very radical reduction in manufacturing activity is forced on Italian producers. This is hardly likely as the citrus crop is difficult to curtail and certainly the gathering of the fruit and the production of the citrate will be continued, even if prices should go considerably under 200 lire.

Tariff Raise Denied

The present tariff on citric acid is 17 cents, unchanged from the Fordney rates. An attempt to increase the rate one cent to eighteen cents was unsuccessful last year. It was urged by domestic producers that this change was necessary to equalize production costs. As practically all of the figures used in computing this further differential was based on the then prevailing price of 46 cents, the drop in present market value to 35 cents has changed the entire complexion of the situation and complicated it much further.

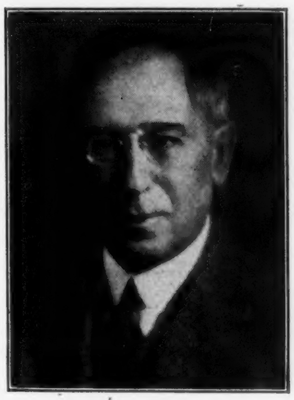
It will be interesting to follow the developments in the international markets and the struggle for the supremacy between synthetic and natural. Will the history of citric acid duplicate the story of indigo? From present indications it would appear quite likely. In each case the same urge to intensive work was present. Countries having a natural monopoly have time after time attempted by raising unnatural barriers to force prices of commodities to absurd levels. This has in every instance hastened their undoing. Another angle that bears watching is the possible development of further refinements in the present synthetic process which would eliminate the intermediate lime citrate step and bring about the direct production of the acid from sugar.

Future Possibilities Bright

The citric acid is an increasingly important chemical. Consumption is growing. While the greater portion of present consumption goes into soft drinks, medicinals, and the manufacture of various citrates, citric acid has several commercial uses of a strictly industrial nature chief of which are, the disinfection of milk, textile dyeing, calico printing, and to freshen textile colors; for process engraving and in the lithographic trades: in the manufacture of special inks; and in the electroplating of metals. The future of the industry in this country should be satisfactory once the present immediate unstable condition of worldwide business rights its self and the Italian producers find it more profitable to ship into other markets. Production capacity in this country is such that all of our present requirements can be taken care of by domestic makers. Outside of shipments of citrate into England producers here have made little or no effort to enter into competition into foreign markets, but these may prove more attractive at a later date than they do at existing price levels.

Association News

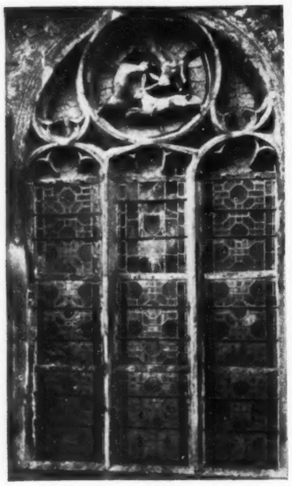
After the extremely busy month of June the past month by comparison was very quiet. Attention centered on preparations for the 82nd Meeting of the American Chemical Society at the Hotel Statler opening August 31, and ending September 4, and the semi-annual meeting of the Electrochemical Society at the Hotel Utah, Salt Lake City, September 2 to 5. Interest was also centered in the fiftieth meeting of the Society of Chemical Industry in England and in the Plant Exhibition opened at London and described in greater detail in the foreign news. Locally, the second outing of the Salesmen's Association of Chemical Industry at the Lenox Hills Club at Farmingdale, Long Island attracted a large number of members and guests.



Moses Gomberg, Pres. American Chemical Society

At least 2,000 chemists, engineers and those allied with the various branches of the chemical industry are expected to attend the section meetings of the A. C. S. The last two meetings have each set a record for attendance and the general committees in charge under President Moses Gomberg look to eclipse the number reached at the Indianapolis gathering.

A symposium of "New Research Tools" will be the opening event of the meeting, presided over by Dr. Karl T. Compton, president of the Massachusetts Institute of Technology. Twelve important new research tools will be discussed.



Business Today and Always

A Review of First Principles

By George F. Hasslacher

The "rabbit window" of the Paderborn Cathedral, shown opposite, inspired the "three rabbits" trade-mark of the Boston firm of advertising agents—a curious example of our debts to the past.

GRECIAN art has stealthily infiltrated via American engineers into Japan, China and elsewhere, and we find that all but unknown the window motif of a cathedral in Westphalia has been adopted as an American trade-mark,—thus we may suspect the unrecognized debts of the business world to the classical art of the past.

Similarly, business in its growth to present developments has drawn heavily on the philosophies and religions, absorbing cardinal principles for best success. It was the slow adoption of these principles that probably tempted the best minds into business, instead of going into statecraft, the professions, the arts and the sciences. While money lending at interest was held contemptible, while the warning was "Caveat emptor", while it was thought necessary for one party to lose while the other gained, there was little attraction or incentive in business for the creative and the executive mind.

Big business presupposes honesty. Not this honesty takes on many nuances, but in its essence it must closely adhere to the general law. It comprises an honesty of purpose as well as of dealing—an honesty with itself, bringing into play the other homely qualities of restraint and self-control.

We have, for instance, the paper industry groaning from over-capacity. Yet mills are being built to add to the confusion of over-production. Are the builders of these mills really honest in the larger sense; or are they, as has been hinted, merely stock jobbers hoping to unload the properties on the unsuspecting ?

Oh, yes, over-production is due to modern production efficiency. Still, did one ever hear of an over-production of steam whistles ? We could well imagine a glut of the market for this product even before the turn of the century, if its manufacturers had expanded facilities and burst with a productive enthusiasm to match the radio manufacturers of the present time.

Courage to produce in anticipation of a future market is to be commended. A foolish rashness to produce willy-nilly will bring about the inevitable disaster of flooded consuming points.

The consumer also has found ways to transgress the strict sense of honesty. The modren contract for "total requirements estimated at so-and-so" without a minimum quantity to be taken and with "protection against decline in price," offers many opportunities for the over-zealous.

Big business requires too, a certain amount of humility (a statement that may sound strange to the modern mind). With humility comes a feeling of responsibility to the customer, to the stockholders, and to the public at large. It is a quality that is important for successf ulcooperation within the organization as well as for contacting with the outside world.

In anxiety to have this thought implanted in their employees, some houses have erred on the other side in setting up the slogan "The customer is always right." The all-inclusiveness of these words points to their inaccuracy.

Much advertising of the present age employs an excess of language, as each house tries to claim the superlative. We can imagine the curiosity of the colonial cabinet maker whose pieces now sell to museums for thousands of dollars, in reading the promises of modern furniture makers. How surprised he would be to find that these articles, praised in overflowing language, are but shabby copies of his handiwork. A sober reflection of responsibility to the public has been a stimulating influence for the better for many a large organization.

Big business requires industry. This industriousness means an application of brains as well as hands. It presupposes a minimum of waste effort on the part of each individual and a conservation of the strength of key men by the proper delegation of authority and responsibility to juniors.

Business to be healthy should not have too much tinkering with the principles that are its foundation stones. If these first principles were given proper consideration no doubt the business world would be well on the way to overcoming the depression.

Plant Management

A Department
Devoted to the Business Problems of Chemical-Process Production

The Patents Racket

PATENT rights matter a good deal more in the chemical field than in most industries, and as they matter most to the operating and research executives it is logical that the technical men of the industry should furnish constructive leadership in the oft-debated, long-delayed patent reform. The entire patent situation has drifted into a morass of inefficiency and injustice that gets deeper and dirtier every year. Unless drastic action is taken the protection of intellectual rights, for which the patent system was devised, will degenerate into a racket as unsavory as a beer war or a night court.

REFORM might well concentrate upon two points—a more prompt and more expert handling of patent applications and a swifter, less technical handling of patent litigation.

IT IS reported that there are nearly 20,000 chemical patent applications alone now filed and awaiting issuance. And the number mounts higher every month. Much of the chicanery practiced in patent practice is made possible by the "patent pending" phase, and "claims allowed" result in most of the patent lawsuits. It will take more examiners and better trained examiners promptly to grant claims that do not conflict, that are either "so broad that a truck can be driven through them" or "so close that a flea could not live within their limits." Quicker and better patents are the first requisite of a sound patent justice.

PATENT litigation has become so technical as to defeat the true purpose of the law. The originality of a discovery and its usefulness in the art of the industry are so easily tied up in legal red tape that scores of large corporations find it cheaper to infringe and then fight than to do original research themselves or bargain fairly with the patentee of a new product or new process. The establishment of a special Court of Patent Appeals should help greatly, and we are glad the American Chemical Society is lining up behind this sensible proposal. The same influential organization might well lend its best efforts to effect a reorganization of the Patent Office. No more worthy causes could be found for which this lusty giant among scientific societies might fight either for the personal benefit of its individual members or to further the development of both the science and the industry of chemistry.

What's the Use of Accident Statistics

By W. Dean Keefer*

INDUSTRIAL executives are coming to take a new efficiency view of accidents. They are discarding the old idea that accidents are only "unexpected happenings" and that a certain percentage of them are bound to happen. The new view, first of all, makes a distinction between the primary "unexpected happenings" in the plant when something goes wrong and the "injury" that may or may not result from this accident situation. From this viewpoint, every "accident situation" in a plant is a real hazard. An "accident situation" means that the basic conditions are right for a possible injury to a worker. But as a matter of averages—according to special investigations made by a large insurance company—there will be only a small percentage of injuries to workers. According to this tabulation, out of every 330 accident cases there was only one major injury and 29 minor injuries—and in 300 of the 330 cases there was no injury at all.

However, from the efficiency viewpoint there is still more to the problem. In every one of these 330 cases there will be an interruption—a failure—in orderly plant processes. And in most of the 330 cases there will be some property damage—to a machine, to tools, or to materials. Hence, the only thorough way to eliminate possible injuries to workers is to eliminate "accident situations" that may cause injuries. Conversely, when plant processes are so improved as to remove most of the "accident situation" breakdowns, the accident record of the plant is certain to be improved. It is from this viewpoint that Henry Ford once said "Production without safety is inefficient; we feel that accidents are absolutely unnecessary."

This new economic view of accidents has been stimulating an increased interest by managers of chemical plants in compiling and using accident statistics. This is splendidly proved by the 1931 edition of "Industrial Accident Statistics" published by the National Safety Council. This includes the annual accident experience of more than 4,000 establishments reporting in 28 different industries. In only five of these industries do a larger number of establishments report than for the chemical industry. The chemical industry is represented by 211 establishments which employed more than 80 000 men who worked more than 200,000,000 man-hours. This includes ten different chemical groups, ranked in order of the total number of firms as follows: explosive manufacturing 26; paint and varnish manufacturing 16; soap manufacturing 16; carbon products 15; acid manufacturing 15; pharmaceutical and fine chemical manufacturing 15; chloride and alkali manufacturing 13; industrial gases 11; dye manufacturing 9; coal tar distillers 9.

It is interesting to note, among the 28 industries, that the chemical industry ranks tenth in accident frequency rates and thirteenth in accident severity rates. Among the ten groups mentioned, carbon products has the lowest accident frequency rate—less than one-third of the total group average: and coal tar distillers group has much the highest rate—nearly three times as great as the average. It is further interesting to note that 106 identical plants which have been reporting for the past three years reduced their frequency of lost-time injuries by 20 per cent and the severity of these injuries by 6 per cent.

It is further interesting to note that frequency rates increase in inverse proportion to the size of the plant; that is, the smaller plants have the higher average accident rates, while plants with 750 to 1,000 employees have only one-fourth as many accidents as plants with less than 100 employees.

A study of the detailed accident reports from these plants shows a wide variation in accident frequency. For example, 25 different firms, nine of which have

*Director, Industrial Safety Division, National Safety Council.

Nature of Injury	Degree of disability in per cent of permanent total	Days lost
Death	100	6,000
Permanent total disability	100	6,000
Arm above elbow; dismemberment	75	4,500
Arm at, or below elbow, dismemberment	60	3,600
Hand, dismemberment	50	3,000
Thumb, any dismemberment of	10	600
Any one finger, any dismemberment of	5	300
Two fingers, any dismemberment of	12½	750
Three fingers, any dismemberment of	20	1,200
Four fingers, any dismemberment of	30	1,800
Thumb and one finger, any dismemberment of	20	1,200
Thumb and two fingers, any dismemberment of	25	1,500
Thumb and three fingers, any dismemberment of	33⅓	2,000
Thumb and four fingers, any dismemberment of	40	2,400
Leg above knee, dismemberment	75	4,500
Leg at or below knee, dismemberment	50	3,000
Foot, dismemberment	40	2,400
Great toe, or any two or more toes, any dismemberment of	5	300
One toe, other than great toe, any dismemberment of	0	....
One eye, loss of sight	30	1,800
Both eyes, loss of sight	100	6,000
One ear, loss of hearing	10	600
Both ears, loss of hearing	50	3,000

Scale of time charges for death and permanent disabilities.

Basis employed by the National Safety Council for preparing accident statistics

from 100 to 500 employees, had not a single lost-time accident for 1930. In contrast, a considerable number of firms had accident rates from five to fifteen times as great as the average for their group.

Thus these reports indicate that accidents can be controlled. As an important step toward the control of accidents the National Safety Council has been working for a number of years to encourage industrial establishments of the country to keep uniform accident records. Toward this end two Safe Practices Pamphlets which have had very large circulations have been published—namely, "Industrial Accident Statistics—How to Collect and Tabulate Them" and "Industrial Accident Statistics—How to Analyze and Use Them." In addition, the cooperating members of the Chemical Section of the National Safety Council have been persistent in urging a larger number of chemical establishments to begin the systematic tabulation of their accident records. For example, at one of the recent Annual Safety Congresses, Leonard Greenburg, with the U. S. Public Health Service and Yale Medical School, who was Chairman of the Chemical Section, so urged the executives of chemical industries in attendance.

"In order to know," he stated, "how good or how poor your plant is standing up with respect to accidents, you must have accurate statistics on the number of men employed, the number of working days they are employed, etc * * * It seems so obvious," he continued, "if several plants can carry on the manufacture, we will say, of nitric acid and have an accident rate of 100 per 1,000 man-hours, that most every plant in the industry should in a general way be able to equal that record; and if a plant has a record of two or three times that, this plant needs careful attention. * * * The Chemical Section desires and asks your earnest cooperation in this matter so that we may be able to be of more service to all of the manufacturers in the chemical industry."

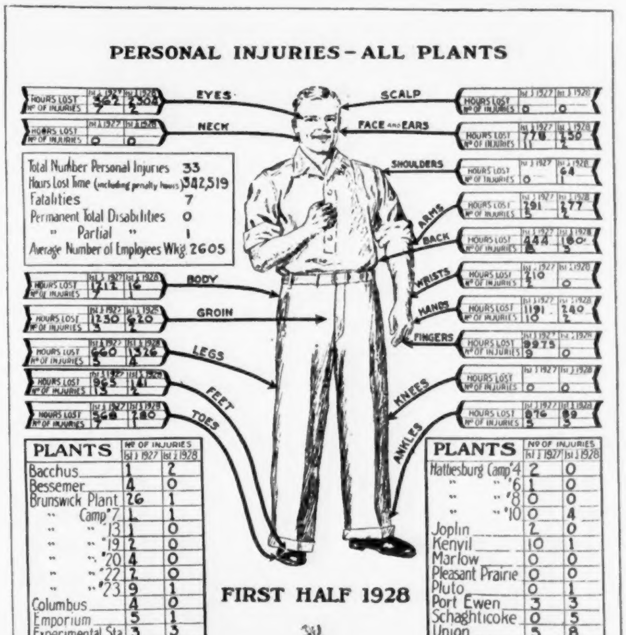
The first necessary step toward a thorough accident prevention program is to tabulate reliable accident statistics. To combat his accidents intelligently, the plant manager must know their causes. In such a program two major problems are represented, namely, how best to assemble and tabulate the information about accidents, and then how best to use this information. To summarize the problem, such a program will have at least six worthy objectives:

1. To study the causes of accidents so that suitable means may be employed to prevent their recurrence.
2. To determine whether the accident record of his plant is getting better or worse.
3. To compare his accident record with the records of other establishments in the same industry.
4. To prepare brief comprehensive reports for all executives.
5. To secure the cooperation of the foremen.
6. To interest the workers in safety.

The record of each accident should include all of the essential facts from the time of the occurrence of the accident until the injured person is back at work or until the case is otherwise adjusted. Such a program, of course, demands cooperation between a number of different plant departments, including operating, safety, medical, plant hospital or first aid, employment, and possibly the legal or accounting department.

The plan should include suitable hospital report forms, hospital record cards, the foreman's report of the accident which should be made promptly, and a permanent record of employment including all of the usual personal data.

It is fortunate for progress in this field that a number of influential national agencies have been cooperating for a considerable period of time in promoting uniform methods in tabulating industrial



How one chemical company visualized its accident record

accident statistics. These agencies include the International Association of Industrial Accident Boards and Commissions, the U. S. Bureau of Labor Statistics, the U. S. Bureau of Mines, the Portland Cement Association, the National Safety Council, and others.

These agencies have agreed upon standard definitions for such terms as average number of employees, number of hours worked, and the like. They define a "lost-time injury" as "any injury, arising out of and in the course of employment, resulting in death, permanent injury (such as the loss of or loss of use of a finger, eye, etc.) or loss of time other than the day or shift on which the injury occurred."

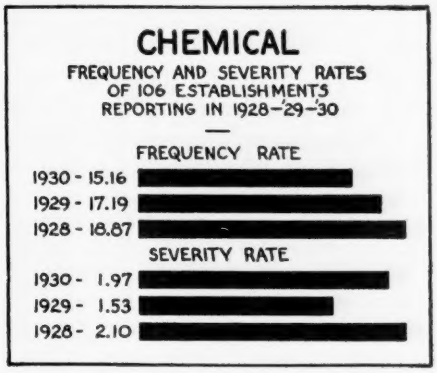
They define permanent total disability and permanent partial disability and they have agreed on a scale of time charges for death and for different permanent disabilities as affecting the different parts of the body. This scale is shown on page 163.

The detailed application of this scale to individual cases has been the subject of many discussions at safety conferences and much correspondence by the National Safety Council and other organizations. For example, a safety director asked this question: "Why should we make an allowance of 300 days loss of time for the loss of a finger and 1,800 days for the loss of an eye when the actual time lost in each case amounted to about six weeks?' The answer, as stated in one of the Safe Practices Pamphlets is, "In formulating the scale it was estimated that the working life expectancy of the average worker is about 20 years or 6,0000 working days. This chart was thus determined for all industrial accidents resulting in death or permanent total disability. For injuries known as "permanent partial disabilities" a degree of disability in per cent of permanent total disability is charged. Thus, the loss of a finger is charged 5 per cent of permanent total disability of the entire body; that is, 5 per cent of 6,000 days or 300 days."

Relating to the use of industrial accident statistics, the safety engineer is reminded that a continued reduction of his accidents will depend largely on the knowledge of the accident causes. Thus he needs

A prominent display of injury records will help to reduce the number of accidents considerably

statistics which will tell for each accident "where, when, what, whom, and why." This information automatically calls his attention to conditions or circumstances which could have been changed to have prevented the accident.



Chemical industry is surely correcting the bad name it has acquired

As a preliminary step it is recommended that the safety engineer carefully prepare a classification of the basic causes, both supervisory and physical, of possible accidents in his plant. Processes in different chemical plants may differ so widely that any general classification might have to be considerably modified. This classification probably would include such items as acid lines, tanks, faucets, lack of proper protective clothing, walkways and platforms, stairways, carboys, fire and dust explosion hazards, and hazards from static electricity. It also should include such hazards common in all industrial plants as falling objects and falls, machinery, ladders, flooring, obstructed passageways, general housekeeping conditions, and the improper use of gas masks, helmets, shields, goggles, uniform and aprons, protective boots, hats, and gloves.

Such a classification of the general and special hazards of the plant usually leads to a recognition of a number of accident conditions which may be easily corrected.

Such a study, especially for a small plant, should be based on a tabulation of accident experience over a number of years to make possible a true picture of plant conditions.

Such a record makes possible a comparison of the accident results of the plant with results from other similar plants. It also makes possible a continuous safety competition with other like plants all over the United States, either through the regular annual reports of these plants to the Safety Council or through mutual arrangements; and it also makes possible competition between the various departments of the plant.

For convenience in their use, the plant or department accident experience should be portrayed in graphs or charts, or in other comparative forms. Some of the accident trends which it usually is advisable to show are: (1) monthly average number

of closed cases; (2) average number of days lost per closed case; (3) average compensation benefit per closed case; (4) comparison of lost-time accidents sustained in course of employment with lost-time accidents occurring outside of employment; (5) trend of eye accidents and other like accidents.

Such accident records, contrasting the experience of different plant departments, often form the basis for a new sort of accident interest by the foreman of these various departments. Also, such detailed department records make possible the creation of a

Cooperation can be developed by the constant display of posters

new kind of safety interest by employees, who thus may be encouraged to enter into a keen safety competition with other departments.

Accident records can be used in many effective ways for general plant display to develop and maintain the plant safety atmosphere. These include accident thermometers, changeable pictures of airplane races, ball games, auto races, and the like.

Chemical Industry Aroused

As previously stated, it is encouraging to know that an increasing number of chemical organizations are keeping systematic accident records. Some of these companies give interesting testimony relating to the value of this part of the accident prevention program. For example, an executive of a salt manufacturing company stated at a National Safety Congress, "We have been using uniform accident records for about five years now. We use at all four of our plants the regular forms, and it is really of great interest to compare our own plants with others * * * * * It is a great help to us, and I would like to see everybody in the chemical industry, both the larger plants and also the smaller ones, send in their accident statistics."

Equipment Bulletins

Plant Managers, plant engineers, consultants, those in charge of operations, and purchasing agents will find in this column valuable suggestions in the way of new booklets bearing on equipment, etc.

The Plant Management Department of Chemical Markets will be glad to forward requests for the above booklets to the proper channels for attention should this be preferred.

General Ceramics Co., 71 W. 35 St., N. Y. City, has issued Form 102, describing General Ceramics Pyrotone Rolls and General Ceramics Hard Stoneware Rolls.

The Patterson Foundry & Machine Co., East Liverpool, Ohio, has recently released a leaflet describing the Type "AS" Series of Paterson Pebble Mills.

Westinghouse Electric & Mfg. Co., East Pittsburg, Pa., has announced the publication of their circular 1915, which lists the installations of Westinghouse metal enclosed switchgear. Several photographs are included describing various types of this equipment.

Driver-Harris Co., Harrison, N. J., is mailing to the trade special reprints of advertisements stressing the desirability of using nichrome.

Chemical Construction

Atmospheric Nitrogen Co., has made application to the office of the United States Engineers at Norfolk, Va. to dredge the James River in the vicinity of the corporation's Hopewell plant.

Federal Abrasives Co., division of The Swann Corp. has completed betterments and increased capacity of its abrasive plant at Anniston. Besides an addition to the electric furnace plant, improved special equipment, the result of a long development period, has been installed in the aluminous grain finishing department.

This improved equipment is designed to regulate within close analytical limits the fracture of Regular Aluminous Grain. With this grain variable controlled, it will be possible to fit the grain much more accurately to the particular work which it must do, when used as grain for coating, for grinding wheel manufacture, or refractories.

Eastman Co. has made plans to continue the expansion of its Tennessee acetate cellulose operations at the rate of about $2,000,000 per year until practically all of its activities, with the exception of the parent plant at Rochester, N. Y., are located at Kingsport.

Ethyl Gasoline Corporation, owned jointly by General Motors and Standard Oil Company of N. J., announces that a new laboratory will be constructed at Baton Rouge, La.

One hundred refiners in the United States and Canada are now co-operating with the knock-testing laboratories of the Ethyl Corp., in Kansas City, Mo., Tulsa, Okla., Yonkers, N. Y., and with two units in Detroit. The Baton Rouge laboratory will be completed in about three months, and will be the center of an area extending from Texas to Florida.

Monsanto Chemical Wks has let a contract with The Woermann Construction Co., of St. Louis for the completion of a warehouse at its Monsanto, Illinois plant. Hoerner, Baum and Freese were the architects. The building will be 92 feet by 170 feet and will contain about one million cubic feet of storage space. The cost with improvements will be about $100,000.

Merrimac Chemical Co., has recently let several important contracts for improvements. The contract for the new Glaubers Salt building was let April 8 and the plant will be ready to operate in two weeks. On May 27 contract was let for the Bisulfite building $42,942 to be ready August 12. The extention to the alum plant $31,980, was let June 19 and will be completed early in September. Several alterations in the research laboratory have been ordered. The new office building has been occupied (See rotogravure section).

Cell room of the Westvaco plant at South Charleston, W. Va. The Vorce cell is equipped with stoneware fittings

STONEWARE

In Chemical Operations

By F. Weinreb*

CERAMIC products may be divided into three classes, namely:—(1) earthenware, the fragments of which are porous and non-transparent; (2) sintered or vitrified ware, which is subdivided into two groups: (*a*) in which the fragments are non-porous, dense, not transparent or only transparent on the edges, not white, and (*b*) non-porous, transparent, white porcelain; (3) steatite, the fragments being non-porous and slightly transparent. The grouping of the dense materials into sintered ware and steatite is due to the difference in their chemical composition. Whereas sintered ware, comprising stoneware and porcelain, consists mainly of aluminum silicates, steatite contains neither alumina nor china clay, but soapstone ($H_2Mg_3Si_4O_{12}$).

Earthenware may be divided into: (1) building material (*a*) not of white fracture: bricks, tiles, agricultural drain pipes; (*b*) of white fracture. Refractory material may be classified according to the raw material used: (*a*) alumina fire bricks, (*b*) mixed alumina and silica, (*c*) silica and lime (Dinas), (*d*) oxidic, for instance, and corundum bricks, magnesite, dolomite and chromite, (*e*) carborundum. These materials are used not only for making solid bricks, but also hollow ware, retorts, muffles, ladles, pipes, elbows, etc. (2) Earthenware, commonly known as such, for example, kitchen ware, either with or without a white fracture. Alumina, lime, and feldspar are the raw materials which are mainly used for the manufacture of earthenware.

Stoneware is the ceramic material most extensively used in the chemical industry in the shape of bricks and tiles for lining, floor tiles, pipes, towers, and machinery. Porcelain is transparent, white, and non-porous, and is used for insulators and small laboratory apparatus. Steatite was, until recently, mostly used for acetylene burners and insulators. This material may in the future find more application in the chemical industry, because the raw material (soapstone) resists acids and bases before firing, is mechanically stronger than stoneware and porcelain, and can be machined with greater accuracy. It is possible to drill holes into steatite of 1-10 mm. bore with an accuracy of 1/100 mm. The use of steatite is, however, limited on account of its relatively high expansion coefficient, which lowers its resistance towards changes in temperature. Steatite tiles for lining tanks in which basic liquors are boiled have given more satisfaction than either stoneware or porcelain.

It has to be emphasized that the above classification does not rigidly mark and define the ceramic products as uniform chemical bodies. On the contrary, not only do the products of the various ceramic works differ, but the products of the same works differ and are dependent upon the following factors: the choice of the raw material, the care bestowed on its preparation, the fineness of grinding, the method of purifying (whether the material is filtered and freed from iron), the method of moulding and shaping, the duration of the firing, the temperature, and the time allowed for cooling.

The problems arising from the use of ceramic articles in the electrical and chemical industry acted as an incentive to the manufacture of ceramic ware; and efforts have been made by the ceramic industry to meet the demands of the chemical industry on the following points:—Increase of the mechanical strength; chemical resistance, especially against the attack of bases; heat resistance; ability to resist changes of temperature; density or non-porosity; and the manufacture of special masses and special plant. It was not an easy task to find means and a recognized basis

*Presented before Birmingham and Midland Sections, Society of Chemical Industry.

of applying to ceramics the testing methods used in chemistry and engineering. For instance, ceramic products have a softening point, not a melting point, which depends not only on the temperature, but on the period of heating and on the pressure to which the material is exposed. The measuring of the softening point is done by means of the well-known Seger cones. Whereas dense ceramic products, such as stoneware, porcelain, and steatite, at normal temperature, approach or even surpass cast iron as regards compression, all ceramic products differ from most metals, except silicon iron, on account of their brittleness. Now that methods of testing have been developed, it has become possible to compare the mechanical, thermal, and electrical properties of the various ceramic products, these leading to their improvement.

The graphs show the progress which has been made since 1905 in the physical properties of stoneware. This progress continues. Special masses have lately been developed of higher tensile strength to meet the demand of high speed rotors of pumps and exhausters. Centrifugal pump impellers of 6½ in. outside diameter can safely be operated at a speed of 3,000 r.p.m., which means a peripheral speed of 5,102½ ft. per min., whilst centrifugal exhausters can be operated at 8,500 ft. per min.

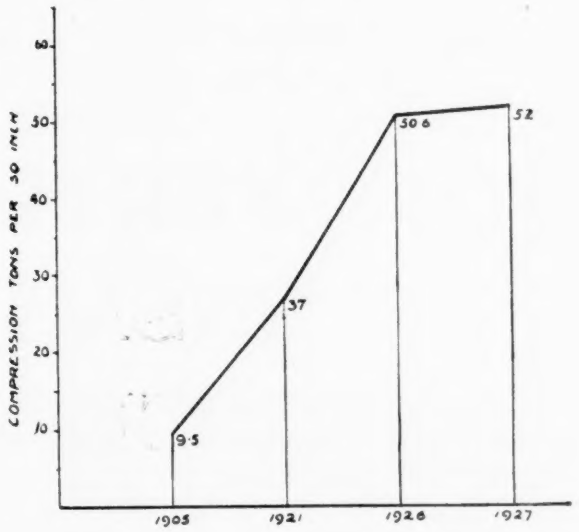
Attacked by a Few Acids

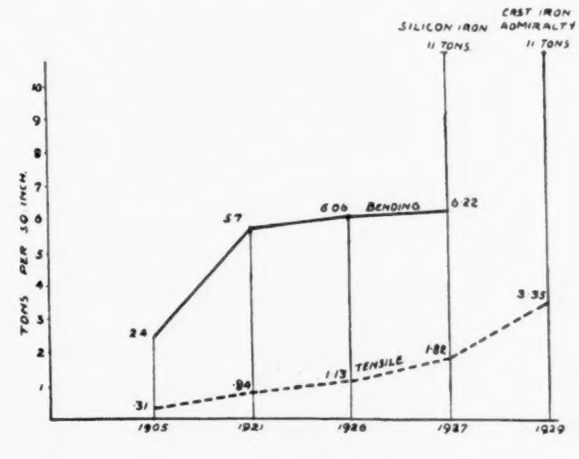
Dense ceramic materials resist all attacks by mineral acids. They are attacked, however, by hydrofluoric acid, and to a certain degree, by phosphoric acid. In addition to acid-proof material, the chemical industry requires material which is capable of resisting bases. Any material, however, containing aluminium silicate will be decomposed by alkalis. Efforts have therefore been made to replace the aluminium silicate by another substance. Magnesium silicate, as represented by steatite, resists bases, but the high expansion coefficient limits its use. One of the earliest efforts aimed at eliminating alumina and silica, and a product was obtained consisting nearly entirely of magnesia. The products made from sintered magnesia suffer, however, from being unable to resist changes of temperature. Magnesia lowers the expansion coefficient of glass whereas sintered ceramic magnesite products of crystalline fracture, such as steatite and sintered magnesia, have a relatively high expansion coefficient. Other masses which resist bases are carbon, chromite, and, at low temperature, zircon. All these masses, however, suffer from the drawback that they are not as plastic as alumina and steatite, and do not allow the making of vessels in the various shapes required by the chemical industry. Another drawback of refractory material is its porosity. At present the ceramic industry has not succeeded in making a material which combines density with the ability to resist high temperatures. Research, however, continues, and small vessels have been made for chemical process work which can safely be used up to 150° without absorbing too much liquid. The following data show how the thermal properties have been improved:

	1921	*1929*
Expansion coefficient	4.9 10^{-6}	0.15 10^{-6}
Specific temperature between 17° and 100° C.	0.1888	0.199
Heat conductivity in kg. calories, per metre, per hour, per degree centigrade	1.2	3.01

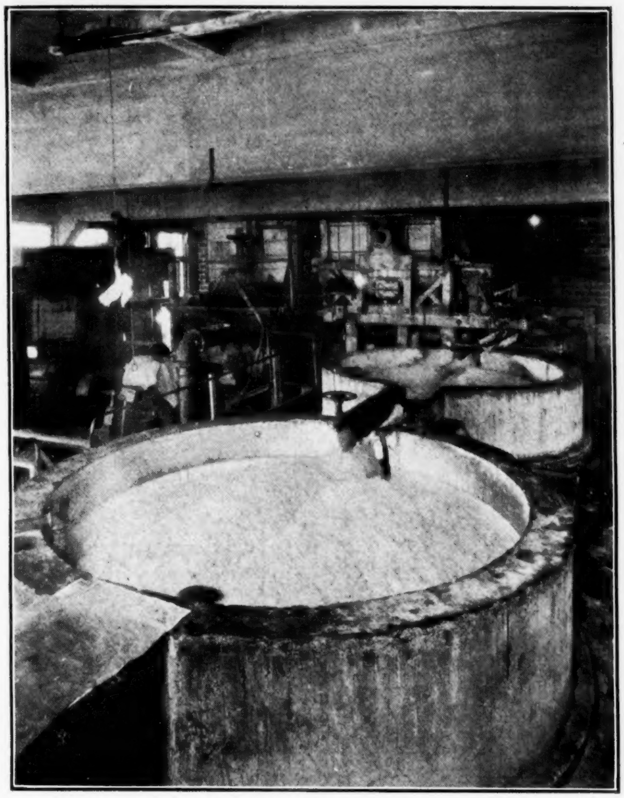
Porosity

The usual brown stoneware shows a water absorption of 0·5—1·5%, an absorption which does not interfere with its ordinary use. In some cases, however, the surface of the stoneware shows signs of being attacked, although the acid contents do not dissolve the stoneware. It has been found that this is the case with highly concentrated solutions having





the tendency to deposit crystals, which penetrate into the minute pores and by their growth cause splitting. This has been particularly noted with acid sodium sulphate and chromic acid. Further, losses of metal were noted in electrolytic baths using precious metals, such as gold, silver, and platinum solutions. These losses, which in time represent a monetary value



*Brick-lined tanks in continuous bleaching system at plant of Oregon Pulp & Paper Co., Salem, Ore.**

not to be neglected, are also due to the porosity of the stoneware tanks used. It has been found, however, that a sillimanite mass can be used for making very dense vessels with an absorption of only 0·01%. Another variety of sillimanite is, on account of its hardness, used for mortars and pestles, and for the rim of mortar mills.

A new material which promises a wider field of usefulness in "Pyroton," which has been tested for three years by one large chemical firm under somewhat severe conditions. The contents of a "Pyroton" vessel required daily repeated heating from 10 to 90° C. by means of live steam which entered the vessel through an opening in its side, thus exposing this part to considerable stress due to rapid temperature changes. In another vessel live steam entered through a pipe, the opening of which was only 2 in. from the wall, causing in time abrasion, but no fissures or cracking. This material, however, eventually shows signs of sweating. In order to reduce its porosity, glazing is resorted to; and dyeing jigs made from it can be used in textile dyeing and printing of photographic papers, etc. It is not affected by such sensitive emulsions as silver halide, and is, therefore, superior to any other material in use.

Glazing

It has to be repeated that the glazing or impervious coating does not influence the acid or basic resisting qualities of the stoneware. It is the choice, blending, and preparing of the raw material, the preheating, firing, and cooling of the moulded article which make the stoneware acid-proof and non-porous. A silicate glaze will render an earthenware vessel acid-proof only so long as the glaze is unbroken through crazes

Large installation of brick-lined Bellmer Bleachers at plant of the Restigouche Co., Ltd., Athol, New Brunswick

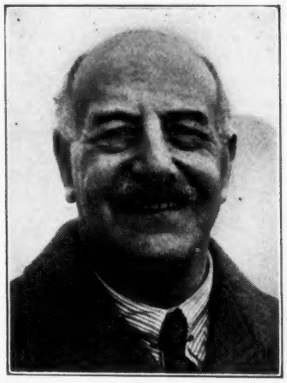
**Photographs, courtesy Westvaco Chlorine Products, Inc., and U. S. Stoneware Co.*

or chipping. This cracking or crazing is the result of unequal surface tension which may have taken place in the ceramic kiln or annealing furnace.

The manufacturer of acid-proof stoneware has, in the first instance, to prepare his carefully-selected material. In some works the dried raw material is ground to such fineness that it has to pass a mesh of 36,600 per sq. in. or 178 meshes per lineal inch before it passes over the magnetic separators. This material will resist acid without glazing. Parts of reciprocating and centrifugal pumps are ground and polished: glazing is only resorted to in order to reduce the porosity. The porous refractory acid-resisting material is sometimes coated first with "Engobe," which is a slip containing a fairly high percentage of the same material as the vessel, and which has nearly the same shrinkage coefficient. This engobe forms an intermediate layer between the body of the vessel and the glaze.

British Chemical Plant Exhibition

On July 13, Sir Harry McGowan and a distinguished gathering of chemical industrialists, including the head of the I. G., Dr. Bushner, opened the British Chemical Plant Exhibition, which has been organized by the British Chemical Plant Manufacturer's Association at Central Hall, Westminster. As it is several years since a general display has been given for the benefit of the chemical and allied industries, more than usual interest was reported from abroad.



The late Lord Melchett, sorely missed at the Exhibition

The Exhibition was organized to demonstrate the progress which has been made in Great Britain in the design and manufacture of plant for the chemical industry, and the numerous other branches of industrial activity which utilize similar equipment. The occasion of the Jubilee Celebrations of the Society of Chemical Industry was deliberately chosen, in view of the splendid opportunity which it afforded to bring the activities of the British chemical plant industry to the notice of a wide circle of chemists and chemical tenchologists from every part of the Empire and other parts of the World.

Coming as it does close on the heels of our own Chemical Exposition many of principal interesting features jibe closely with each other. In both exhibitions, the non-corrosive metals, new alloys, improvements in chemical stoneware, and the fabrication of equipment from acid and alkali resisting materials easily were of first interest.

The Chemical Trade Journal speaking editorially under the heading, "A Record of Progress" says in its July 10th issue:

"Even casual perusal of our account of the principal features of next week's British Chemical Plant Exhibition in London should serve to convince the reader that here is an exhibition which not only merits, but actually compels, one or more visits. No matter in what branch of the chemical-making or chemical-using industries he may be engaged, the visitor will be certain to find a great deal that is of positive value to him. Much of the plant shown is being exhibited for the first time, and the degree of progress revealed to have been made since 1926 is such as to dissipate for ever any lingering belief that the British chemical plant manufacturer is conservative and reluctant to innovations in either design or methods of construction."

Company Booklets

J. T. Baker Chemical Co., Phillipsburg, N. J., has just released No. 4, Vol. 20, in the series of "The Chemist-Analyst." As usual it contains several important contributions to the field of analytical chemistry. "The Analyses of Boiler Scale" by Norman S. Mott and "A Rapid Method for the Determination of Unsaponified Matter in Soaps and Unsaponified Matter in Oils" by Frank M. Biffen of Foster D. Snell, Inc., are the two leading articles. Those desiring the magazine may apply direct to the Company's main office.

U. S. Industrial Alcohol Co., manufacturers of PYRO, describes numerous uses for PYRO around the car, in addition to its function as an anti-freeze, in a new illustrated leaflet. According to the leaflet, PYRO, a specially distilled denatured alcohol, tells dealers and motorists several ways to save time and money in attending to minor service operations around the car, without the use of special tools or equipment. For example, PYRO makes a very effective remover of carbon from automobile and marine engines, at a cost of three cents per cylinder. Sticking valves can be freed by an injection of PYRO into the carburetor intake. When water in the gas tank causes stoppage in fuel supply, PYRO will remove every trace of moisture. Among the other uses for PYRO mentioned in the leaflet are the cleaning of white side wall tires, top, windshield, etc. Numerous other uses for PYRO, particularly around the house, are illustrated in this new leaflet, entitled, "Important Uses for PYRO." Copies of this leaflet will be furnished upon request by writing, U. S. Industrial Alcohol Co., 60 East 42nd St., N. Y. City.

New Incorporations

New York Charters

Cementone Finish Corp., construction—J. L. Israel, 2 Lafayette St., 100 shs com.

Aldrich Pharmacal Labs.—B. J. R. Carples, 258 5th Ave., 10,000 shs com.

York Paint Supply Corp., chemicals—E. Kahn, 342 Madison Ave., 100 shs com.

D. R. Chemists, Chemicals—B. D. Kaplan, 1,440 Broadway, 20,000 shs com

Beacon-Hammond Paint & Chemical Co.—J. G. Meyer, Beacon, 10,000 shs com.

New Jersey Charters

Protane Gas Sales Co., So. Plainfield, Petroleum & Natural Gas—Joseph J. Mutnik, Plainfield, 100,000 shs com.

Leech Chemical Prod.,Inc., Camden, Mfr. Washing Compounds—H. J. Koehler, Camden, 150,000 shs com.

Union Carbonic Gas Co., Elizabeth, Mfr. Gas—U. S. Corporation Co., N. Y. C., 125,000 shs com.

Continental Tanners, Inc., Newark, Leathers and Tanning Prod.—Abraham H. Carchman, Newark.

Velent Mfg. Co., Union City, Toilet Articles, chemicals—Samuel Schneider, Union City, 125,000 shs com.

Delaware Charters

Sanz Corp., Wilmington, Del., deodorants—Delaware Registration Trust Co., 3,000 shs com.

Peggy Worth, Inc.—New York City, creams, lotions, powders, soaps—United States Corporation Co., $1,000,000; 3,000 shs com.

M. & M. Oil Co., Dover, Del., Oil, Gas, Salt, Brine—U. S. Corp. Co., 300 shs com.

Quaker State Oil Refining Co., Wilmington, Del., minerals—Corp. Trust Co., 1,000,000 shs com.

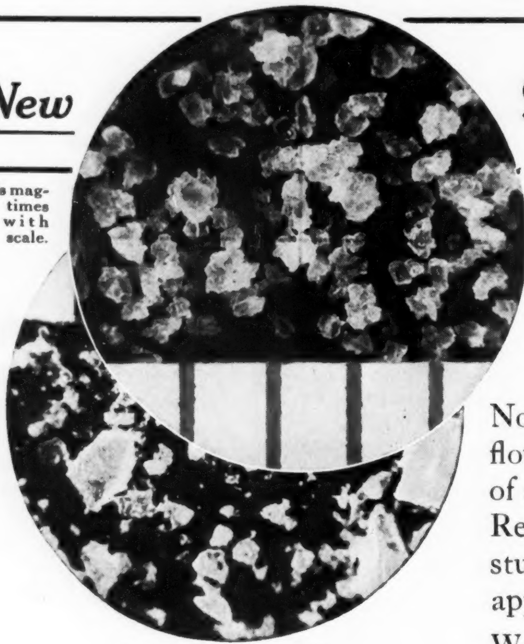
Earl Moffatt & Co., Wilmington, Del., paints, chemicals—Corp. Trust Co., 2,000 shs com.

Announcing

METSO CRYSTALS°

The *New* Sodium Metasilicate

°PATENT APPLIED FOR



Metso Crystals magnified eleven times compared with millimeter scale.

Ordinary Sodium Metasilicate.

Now comes sodium metasilicate in free flowing *crystals*. Since our introduction of sodium metasilicate to industry, our Research Department has continued to study closely not only its properties and applications but also its manufacture.

We are happy to announce this newest metasilicate ($Na_2SiO_3.5H_2O$)—

METSO CRYSTALS

Metso Crystals are uniform grains, free from fine particles and dust and quickly soluble in hot or cold water. Clean, white crystals of sodium metasilicate are the highest development in producing a purer product. Due to uniform size and freedom from dust the Crystals flow freely. Metso Crystals, the modern metasilicate, are shipped in wooden barrels.

Metso Crystals yield strongly alkaline solutions with unusually efficient cleansing power. Metso Crystals rinse free.

The new Metso Crystals invite your critical investigation. If you have never tried metasilicate for your industrial cleaning, request a sample for comparison. Clip the coupon for samples and further information.

PHILADELPHIA QUARTZ CO.,

General Offices and Laboratory
121 S. Third Street, Philadelphia

Chicago Office: 205 W. Wacker Drive

METSO
ACTIVE ALKALI
CRYSTALS

Please send the undersigned:
____a 4-oz. Bottle ____a Pint Can
of METSO CRYSTALS

*We clean*____________________

*Signature*____________________

____

____

CMK

Chemical Facts and Figures

Nitrate Conference Fails—du Pont Acquires Newport—Alcohol Companies Indicted—Freight Rate Hearings—Frankle, Swann Sales Manager

Late in the evening of July 15, at Lucerne, Switzerland, the natural nitrate producers threw down the gauntlet by stalking out of the nitrogen conference, and ammonium sulfate has crowded the alkalies and alcohol out of the center of the 1931 price warfare picture.

Unable to settle their differences, either between themselves, or with the "Cosach", Europe's leading synthetic nitrate producers permitted the one year agreement to lapse, opening the way for a new alignment of price schedules. For months the conferences have been locked by the natural producers who demand a larger share of European business, and refused to contribute generously to the fund established to compensate European synthetic producers for tonnages reduced by the cartel. It is strongly suspected that the synthetic producers were not very far apart at any time during the negotiations. The real fight was the natural versus the synthetic, with by-product sulfate in the role of peacemaker.

This was the status quo when the July conferences were resumed at Lucerne. Some hope was held out that a workable basis might be found, despite the fact, that immediately the air (which is four-fifths the very element so earnestly under discussion) was filled with rumors of proposals and counter-proposals, claims and counter-claims.

Germans Force Issue

Any chance of ultimate success was spiked by the tariff action of the German Reich. On July 15, word was received at Lucerne, that the German Government, ostensibly for the purpose of raising emergency funds, had placed a prohibitive duty of Rm. 120 ($28.80) a ton on nitrogen fertilizer material. This precipitated the collapse that was expected earlier due to the demand of the synthetic faction that Chilean nitrate accept the same quota for this year, while the representatives of the "Cosach" countered by insisting that they be accorded equalization of prices with the synthetic with a differential of £1 a ton and a larger share in the European tonnages.

The first shot, in what may become the most destructive price warfare the chemical industry has yet to witness, was fired by foreign producers of ammonium sulfate when their agents in this country announced, twenty-four hours after the Switzerland debacle, that they had received instructions to reduce prices $4.50 a ton immediately. Domestic producers on this side of the water dropped quotations from $32 a ton to $30 a ton in retaliation. Foreign material was then offered at $26.50 and a few days later well founded rumors were current in the trade of special offerings as low as $23 delivered Gulf ports for imported material.

Chile Finances

How closely the international nitrogen situation is bound to the political was vividly pictured when, on the day following the failure of the Lucerne Conference, the Chilean Government announced a moratorium on its foreign debts, at least to August 1, and quite likely for even a longer period of time. While the nitrate situation was not the only contributing factor to the monetary plight of Chile, it was the most important one. Chile's financial backbone is the payments due from the "Cosach" under the agreement negotiated between the Guggenheim interests, other natural nitrate producers and the Chilean government. In lieu of the former export tax of approximately $12.50 a ton the Government is guaranteed certain returns in the form of dividends on the fifty per cent of "Cosach" stock it holds. With Chilean gold reserves greatly depleted, it was felt in official circles that the only safe position was to withold payments due at this time on the $27,500,000 issue of 6 per cent bonds issued in 1927. On July 13 the Chilean Government had fallen on the question of internal economy measures.

THE MONTH REVIEWED

July

11	Du Pont announces new Krebs Pigment Corp. (180)
12	New regulation requires daily sales report of C. D. No. 5 formula. (179)
15	Lucerne Nitrate Conference fails. (177)
20	Several well-known Chemical houses indicted for alleged diversion of industrial alcohol. (178)
21	Interstate Commerce Commercial hearings on railroad increase. (179)
22	Frankle, new Swann Salesmanager. (180)
27	Henry P. Fletcher tariff commission head announces resignation. (178)
31	Du Pont announces Purchase of Newport. (178)

Unstable Government

On July 21 the Chilean Government again tumbled and was replaced by still another headed by Francisco Garces Gana. He could not muster enough strength to last more than twenty-four hours, and by sun-down of July 23, a new cabinet under the leadership of an old friend of President Ibanez was sitting in the Palace in Santiago wondering, undoubtedly, how best to hold on to the place long enough to get acquainted. The Froedden regime was reported as suppressing demonstrations against the President and a few hours after coming into power a strict press and cable censorship was decreed. Emergency measures designed to alleviate the financial stringency were adopted.

Break Trade Treaty

Chile feels that the fault for the breakdown in Lucerne should rest on Germany because of its tariff action. On July 23 the Chilean Government, in between the ins and outs, managed to dispatch a note to Berlin threatening to abrogate the commercial treaty existing between the two countries since 1862 and condemning in no uncertain terms the tariff change on nitrogen. Later, it announced that it had decided to retaliate by breaking the agreement at the end of three months, the time provided for in the treaty. It was pointed out that the nations, with the exception of Chile participating in the Lucerne meeting had special trade agreements on fertilizers which would permit them to import into Germany despite the new tariff rate. Chilean officials were rather blunt in their statements that Germany's action could only be construed in one way and that, as a direct thrust at Chile's leading industry and chief source of government revenue.

The natural producers have not announced prices (July 27) for the coming fertilizer season and in view of present

conditions it was thought likely that they would not do so for several weeks, although usually prices are given to the trade either in June, or early July. The present figure of $41.10 a ton is really a nominal quotation as all factions are marking time awaiting further developments.

In some quarters it was thought that the European synthetic producers might make a further attempt to reach an amicable agreement among themselves and thus present a united front to the natural producers under the leadership of the "Cosach." It is uncertain what the future course of events may be.

On July 27 a cable from Paris announced that the synthetic producers had held a secret meeting on the 24th, but without coming to any agreement. It was felt in most quarters that some arrangement if only of a very temporary nature would be patched up. Considerable credance was given to this report because of the complete overthrow of the Ibanez regime on the 26th.

Guggenheim Optimistic But—

Additional strength was given to the belief that joint arrangements between Chilean nitrate representatives and synthetic producers by the statement credited to S. R. Guggenheim on his arrival in New York, July 28.

"I am very optimistic and believe that an accord will now be reached," he said. "The industry as a whole needs some arrangement which will prove beneficial to all producers."

Despite Guggenheim's note of optimism the last minute attempt to rebuild the nitrate cartel failed on Aug. 4, after the Belgians refused to subscribe to the license system proposed by German interests.

A report from Syracuse, Aug. 5, stated that the Soviet was negotiating for several men closely connected with American nitrogen fixation plans in an effort to build up a nitrate industry in Russia.

---

du Pont Acquires Newport

The chemical industry was awakened from its summer lethargy to find that several prominent companies were quietly carrying on the merger idea where it was hung high and dry with the end of the bull market in 1929. The two most prominent names connected together were du Pont and Newport. On several other occasions these two interests have been mentioned as possible merger material but in each instance the matter has been dropped.

Reports emanating from sources very close to both corporations admitted during the month that negotiations were again under way. On July 31, du Pont announced the purchase of Newport dyes, subject to Newport stockholders' approval.

Alcohol Indictments

The Federal Government's long hinted at, sensational prohibition story splashed across the headlines on Monday morning, July 20. "Indict Big Concerns in Alcohol Ring" is the way the staid NEW YORK TIMES headed its account of the Baltimore Federal Grand Jury which handed down indictments against 53 corporations and individuals on charges of conspiracy to divert industrial alcohol into bootleg channels. Such companies as United States Industrial Alcohol and its subsidiary, the United States Industrial Chemical, American Solvents and Chemical, Roessler & Hasslacher, The Glidden Co., and the American Oil & Supply Co., were also named in the account given to the press.

The Baltimore action was the culmination of two year's time and an expenditure of $500,000. Several officials appeared urging that the larger and better known companies be dealt with directly rather than subjected to the summary action of the Grand Jury.

Alcohol producers feel that their case is being tried in the newspapers instead of in the courts and point bitterly to the increasing number of obstacles the Government is erecting in what they say is a futile effort to enforce the 18th amendment. In the past month the Bureau of Industrial Alcohol has forced producers to report daily the sale of even completely denatured. One very prominent Philadelphia alcohol producer was recently ordered to stop selling C. D. material to a customer whom the Government suspected. The alcohol manufacturers agreed to follow these instructions, providing written instructions were issued. Now the customer is suing for a breach of contract.

The present indictments are based almost entirely on the use, or rather the mis-use of the special formula for lacquer thinner and practically places the policing of the users of industrial alcohol in the hands of the producers. This is the most serious charge the alcohol manufacturer makes against the present enforcement policy of the Government. As yet no date has been set, but it is reported from Government circles that the cases will probably not be brought into court before October or November.

COMING EVENTS

American Chemical Society, Hotel Statler, Buffalo, August 31 and September 4.

American Paint and Varnish Manufacturer's Association, Drake Hotel, Chicago, Dec. 2-3.

The Electrochemical Society, Hotel Utah, Salt Lake City, September 2-5.

National Paint, Oil and Varnish Association, Atlantic City, N. J., Oct. 5-8, Hotel Ambassador.

Salesmen's Association, Third Golf Tournament, Dunwoodie Country Club, Yonkers N. Y. Aug. 18.

Washington

Less than two years after forming the new Tariff Commission for the President, Henry P. Fletcher, close Hoover confident, forwarded his resignation to the White House. When pressed for an explanation Mr. Fletcher stated that he had only accepted the position until such time as he could organize the commission properly and redeem one of most important pre-election campaign promises of the Administration. Mr. Fletcher leaves an enviable record behind him, every report or investigation requested by Congress will be completed by the time the legislators convene in Washington in December. Leaders of the chemical industry are outspoken in their praise of Fletcher and regret that he is stepping out at a time when his understanding, technical knowledge and above all his integrity are desired. While Mr. Fletcher would not disclose what he intends to do after leaving the commission, it is stated authoritatively that he will not enter politics as has been persistently rumored.

One of Chairman Fletcher's last acts* was to announce that new members of the foreign staff of the Tariff Commission would leave this country for Europe to assist in the present investigations of the rates of duty, under the new tariff law. This mission marks the second addition to the foreign branch of the commission made this year and is in keeping with the announced policy of that body to obtain "the most reliable information on foreign costs." In carrying out this policy, the commission early this year sent John F. Bethune, for many years secretary of that body, to Europe to take charge of foreign investigations. Those leaving to help in the foreign work are: Louis S. Ballif, G. Raymond Webb, William H. Disbrow, Walter L. Sanders and Mrs. E. K. Southworth.

*Agrees to remain to Nov. 15

Isopropyl Denaturant

The Bureau of Industrial Alcohol of the Treasury Department has adopted specifications for denaturing grade isopropanol and commercial alphaterpineol which were authorized as of July 15 as additional denaturants for alcohol of C. D. No. 5 formula:—Those connected with the industry are urged to obtain copies of the regulations.

Charge that European sulfate of ammonia is being dumped in this country is being investigated by the Bureau of Customs.

Customs officials declined to go into details at the present time as to the country suspected or the name of the person requesting the investigation, but admitted that the matter is before them. What effect the recent radical reduction in prices, brought about by the failure of the Lucerne Conference, will have officials declined to say.

Daily CD 5 Reports

A regulation requiring alcohol producers or agents to report daily all sales of completely denatured alcohol in lots of more than one drum was issued during the month by the Bureau of Industrial Alcohol and the Bureau of Prohibition.

Proposed Freight Rates

The chemical industry is vitally concerned in the attempt of the railroads to obtain a general increase in freight rates of 15 per cent. Chemicals move in tremendous volume and are relatively cheap. The fertilizer division of the industry is specially affected, and is leading, at the moment, the opposition before the Interstate Commerce Commission. A report, "The Financial condition of the railroads," by Wilbur La Roe, Jr., prominent Washington attorney and former examiner on the Commission, has been rather widely circulated among the executives of the industry and is quoted from in detail below.

Various traffic men of the chemical companies, do not wholly agree first, as to the real necessity of an increase for the railroads, second, whether in the form preposed it would actually result in the desired increase in the carriers revenue, and third, as to the advisability of attempting concerted action by the industry to prevent such a rate from being approved.

It is apparent, however, that all agree that every effort must be made to see that all the facts bearing upon the question are laid before the Commission in order that the Commission's decision, when made, shall reflect the true conditions. The Commission is sitting as a judicial tribunal, and is confined to the record made in the case, in its determination thereof.

Most of the fertilizer companies have petitioned the Commission for a hearing in opposition. D. A. Dashiell, traffic manager for Royster Guano and F. G. Moore, traffic manager for Davison Chemical will represent some of the fertilizer companies.

The railroad executives and security holders (insurance companies, banks, and other large owners of railroad stocks) testified at a meeting July 21. The testimony of the shippers will be heard beginning August 10. Counsel for the railroads urged speedy action stating that their clients were in particularly bad plight. The established policy of the Commission is, however, to allow two full weeks notice before any hearing, and to permit all interested parties to be heard.

*Figures as of Dec. 31, 1930

Claims and counterclaims fill the air. While recognizing the necessity of protecting the railroads from bankruptcy, chemical shippers insist that the carriers should be limited in some way as to what they do with the increase, if granted. It is suspected that the railroads may be urging a higher rate on long haul traffic to supply a war-chest for combating the truck on the short haul. Others feel that the Commission should proceed immediately with a thorough investigation of the present efficiency of the management of the carriers. Still others insist that the railroads have done nothing in ten years to combat successfully competition and, therefore, are entitled to little consideration. All agree that, under present conditions, it will be impossible to pass along to the consumer the increased rate and that if granted, it will hurt, rather than help, by supplying additional fuel to price-cutting practices.

It is pointed out, the Commission must decide whether the increase, if granted, will become an undue burden on any particular industry. This question can be decided by the Commission only if industries which feel that they belong to this class make proper and vigorous presentation of their case during the August hearings.

One well-informed traffic expert, connected with a large chemical company, with wide diversity of products, was outspoken in criticizing severely the dilatory practices of the railroads in fixing new rates. He asserted that the carriers were losing considerable tonnage for this reason and asserted that he himself had been waiting for six months for a rate that was fair and equitable and would mean considerable business for the carrier. In the meantime the business is going to a trucking concern.

The La Roe report is as follows:*

I. Railroad Dividends During the Past Few Years Have Been the Greatest in History

The dividends declared by the steam railroads of the United States for each year, beginning with 1910, are as follows:

Year ending—	*Dividends Declared*	*Average Rate on dividend-yielding stock*
June 30, 1910	$405,771,416	7.50
June 30, 1911	460,195,376	8.03
June 30, 1912	400,315,313	7.17
June 30, 1913	369,077,546	6.38
June 30, 1914	451,653,346	7.97
June 30, 1915	328,477,938	6.29
June 30, 1916	342,109,396	6.48
Dec. 31, 1916	366,561,494	6.75
Dec. 31, 1917	381,851,548	6.81
Dec. 31, 1918	339,185,658	6.60
Dec. 31, 1919	335,241,935	6.33
Dec. 31, 1920	331,102,938	6.52
Dec. 31, 1921	456,482,092	9.02
Dec. 31, 1922	338,805,695	6.37
Dec. 31, 1923	411,881,766	7.30
Dec. 31, 1924	385,129,890	6.37
Dec. 31, 1925	409,645,051	6.52
Dec. 31, 1926	473,682,830	7.32
Dec. 31, 1927	567,280,717*	8.47
Dec. 31, 1928	510,017,987	7.12
Dec. 31, 1929	560,901,941	7.47
Dec. 31, 1930	506,624,912 (a)	7.82 (a)

*Includes unusual items amounting to $76,299,528 not representing cash.

(a) For Class I railroads only. Figures for all not yet available.

Attention is called to the dividends paid during the last three years, and especially to those paid during the "depressed" year 1930.

II. The Net Income Has Increased

In the railroad business, as in other industries, one of the most significant figures in gauging the industry's prosperity is the net income figure. Below are shown the figures for each year, beginning with 1910:

Year ending—	*Net Income*
June 30, 1910	$583,191,124
June 30, 1911	547,280,771
June 30, 1912	453,125,324
June 30, 1913	546,761,119
June 30, 1914	395,492,305
June 30, 1915	354,786,729
June 30, 1916	671,398,243
Dec. 31, 1916	735,341,165
Dec. 31, 1917	658,224,696
Dec. 31, 1918	442,336,131
Dec. 31, 1919	496,609,104
Dec. 31, 1920	481,950,969
Dec. 31, 1921	350,539,608
Dec. 31, 1922	434,459,186
Dec. 31, 1923	632,117,581
Dec. 31, 1924	623,399,393
Dec. 31, 1925	771,053,077
Dec. 31, 1926	883,421,795
Dec. 31, 1927	741,923,916
Dec. 31, 1928	855,017,540
Dec. 31, 1929	977,229,694
Dec. 31, 1930	523,907,472 (a)

(a) For Class I railroads only. Figures for all not yet available.

III. Corporate Surplus and the Free Unappropriated Surplus Have Substantially Increased

Corporate surplus is very important in Gauging the financial strength of a corporation. It represents the difference between assets and liabilities. It may have been put back into the property in the form of improvements; it may have been used to strengthen some reserve fund, such as depreciation reserve; or it may not have been allocated at all but used for outside purposes such as the acquisition of stock in other corporations. The part of surplus which is not allocated is known as free surplus and is equivalent to what the individual "lays aside for a rainy day." The following table shows the total corporate surplus and total free surplus for class I railways in the United States by years beginning with 1920:

Year	*Total Corporate Surplus*	*Total Free Surplus*
1920	$2,940,834,802	$1,847,435,508
1921	2,959,923,263	1,921,328,418
1922	3,057,344,295	2,041,191,125
1923	3,289,261,345	2,253,426,878
1924	3,510,920,223	2,457,137,747
1925	3,820,652,640	2,734,881,156
1926	4,186,731,110	3,055,826,658
1927	4,261,041,507	3,163,640,533
1928	4,632,255,572	3,514,107,395
1929	5,029,171,283	3,885,105,375
1930	4,677,729,691	3,554,961,596

It will be noted that free surplus has practically doubled since 1920.

IV. The Total Free Surplus is Now the Equivalent of About Seven Years' Dividends

Surplus is usually not retained in the form of cash so that it can be conveniently distributed in the form of extra dividends, but it is nevertheless a fact that the present free (or unappropriated) surplus is so large that if it could be converted into cash it would enable the railroads to pay an extra dividend more than seven times as great

as the average dividends declared during the past decade. This can readily be seen by dividing the free surplus of $3,554,961,596 by the average annual dividend (1921-1930) of $4,62825,086. Furthermore, the present free surplus is the equivalent of 11.5 per cent of the total value of these railroads as shown by their own books. The book value of the property operated by Class I railroads is $24,884,674,485 and their total free surplus is $3,554,961,596.

It is a significant fact that the free surplus of Class I railroads (which is less than their total corporate surplus and represents only the *unallocated* portion thereof) is the equivalent of 43 per cent of the par value of all their outstanding common and preferred stocks, including the non-dividend yielding stocks. In other words, if the free surplus were used for dividend purposes the stockholders would receive a dividend of 43 per cent on all common and preferred stocks outstanding, which have a par value of $8,267,128,500.

V. Margin Between Income and Outgo—Operating Ratio

Every business concern endeavors to keep its expenses below its revenues. Otherwise there can be no profit. The "operating ratio" shows the relation between expenses and revenues. If the ratio is 99 the concern is in bad shape because expenses are 99 per cent of revenues and the "margin" has almost disappeared. The business manager is constantly endeavoring to *reduce* his operating ratio. The following figures show the operating ratio for all railroads of the United States since 1920:

Year	*Operating Ratio*
1920	94.36
1921	82.89
1922	79.48
1923	77.88
1924	76.24
1925	74.17
1926	73.23
1927	74.65
1928	72.57
1929	71.85
1930	74.41*

*For Class 1 railways. Figure not available for all steam railways.

VI. Summary

The railroads were never in better physical condition than they are today. The properties are well maintained. Both freight and passenger services are excellent. Financially the railroads are in a strong position. They have paid increasingly large dividends. They have improved their properties. They have built up an enormous surplus out of earnings. They have substantially reduced their operating ratio. Their financial strength has enabled them to weather a period of serious economic depression much more successfully than has business in general. And the railroads were able, even during the depressed year 1930, to pay over half a billion dollars in dividends and still keep their surplus at nearly the highest level in history.

R & H moved from 10 East 40th to the Empire State Building July 18.

Personnel

George Y. Frankle has been appointed sales manager of Swann Chemical Co. to succeed Robert S. Weatherly, who has been made vice president. Mr. Frankle comes to Swann from Grasselli after an association of seventeen years. He started

George Y. Frankle

at their Gadsden, Ala. plant in 1914, and four years later became manager. He served in this capacity until 1925, when he was transferred to Birmingham as assistant to the sales manager in that territory. Since 1927, he has been directing the sales in the Birmingham territory. Mr. Weatherly has been with the Swann organization since 1923, holding the position of Sales Manager since 1928. He is also Vice President of Federal Abrasives Co., a Swann subsidiary. Both Mr. Frankle and Mr. Weatherly will have headquarters at the main offices of The Swann Corp. in Birmingham.

Obituaries

Dr. Edward Goodrich Acheson, eminent for his many electro-chemical discoveries, died July 6, aged 75. Dr. Acheson was the discoverer of carborundum, the transformation of non-graphitic into graphitic carbon, the direct reduction of metallic silicon, the direct reduction of aluminum, the production of siloxicon, the deflocculation of non-fused, non-soluble, nonmetallic bodies and the production of aquadag and oildag, products of high lubricating value.

He was chairman of the board of Acheson Graphite, Acheson Oildag Company, Acheson Corp., Goodrich Corp., E. C. Acheson, Ltd., of London, and the Acheson Ink Co., Inc.

John L. Agnew, vice president of International Nickel Co., died July 8. He would have been 47 years old on July 28th. He had been connected with mining and metallurgical operations since early manhood. The Frood mine, the largest nickel mine in the world, was opened and developed, under his direction, and the extensive development program of the International Nickel, begun in 1924, was carried out by him.

Announcement was recently made of the incorporation of Taylor Chemical Corp. (Del.) which has succeeded to the assets and business of Taylor Chemical Corp. (N. Y.).

The Company has also announced the continuation of the carbon bisulphide plant located at Cascade Mills, near Penn Yan, New York and the completion of the erection of a carbon tetrachloride plant at Wyandotte, Michigan from which deliveries were started July 15th. Charles W. Bowden, director of sales, Pennsylvania Salt, and R. A. Clark, sales manager. J. T. Baker Chemical will have charge of sales. The executive offices will be maintained at Phillipsburg.

Krebs Pigment Formed

DuPont has announced a new company, to be known as the Krebs Pigment & Color Corp., to consolidate the lithopone and dry color businesses of Krebs Pigment and Grasselli, with the titanium pigment business of Commercial Pigments, subsidiary of Commercial Solvents.

The new company is being organized jointly by du Pont, Grasselli, and Commercial Solvents, with Carl H. Rupprecht, now manager of the pigment and Dry color division of Grasselli, as president, and Zack Phelps, now vice-president of Krebs, continuing in the same capacity. Krebs Pigment & Color Corporation will have its main office at 256 Vanderpool st., Newark, with branch sales offices in Cleveland, Chicago, and other cities where the individual companies have previously been represented. Warehouse stocks in twenty-six cities will be maintained as heretofore. Plants will operate at Newport, Del., Newark, and Baltimore, as heretofore. The products and established brands manufactured by the individual companies will be continued.

Personal

Dr. Henry Arnstein, who is acting in an advisory capacity to several Latin American Governments, is on a Central American tour. He will visit Colombia, Panama, Costa Rica, Guatemala, El Salvador, and Mexico, returning late next Fall.

By unanimous vote of the board of directors of The Electrochemical Society, the Edward Goodrich Acheson Medal for 1931 was awarded to Edwin Fitch Northrup, the dean of high-frequency induction heating, and will be presented at the society's meeting in Salt Lake City September 3.

C. F. Vaughn, vice-president, Mathieson in charge of Northern operations has been granted a year's leave of absence, the first vacation he has enjoyed in twenty years.

The Commissioners Court of Brazoria County, Tex., has placed a tax assessment of $12,500,000 for 1931 on the properties of Freeport Texas which the company has accepted under protest.

Fire destroyed (July 9) a storage building at the plant of J. T. Baker Chemical. It caused no interruption in manufacturing or deliveries.

Roessler & Hasslacher has become the selling agent for all grades of completely and specially denatured alcohol produced by Eastern Alcohol, both companies being subsidiaries of E. I. du Pont de Nemours & Co.

Dillons-Klipstein, Ltd., Montreal, is now the sales agent in Canada for Kalbeisch. It will handle the distribution of Kalbfleisch products to the Canadian paper, textile, and other industries.

The new Montreal firm was formed July 1 by the consolidation of Dillons, Ltd., and A. Klipstein & Co., Ltd., of Canada. The new company will also represent Cyanamid and Klipstein in Canada.

John S. Crowl, receiver for Westmoreland Chemical & Color, reports negotiations which will result in the sale of the plant and equipment at New Castle, Pa., to one of the larger chemical manufacturers.

Corn Products has acquired a substantial interest in Resinox Corp., a wholly-owned subsidiary of Commerical Solvents. Resinox is interested in the development of synthetic resins and has a plant at Metuchen, N. J. George Moffett and F. M. Sayre of Corn Products will join the board of Resinox.

Bakelite has appointed Martin, Hoyt & Milne, San Francisco, agents for their products for varnish manufacturers on the Coast. The Electrical Specialty Co. retains the agency, in Pacific territory, for all other existing Bakelite products.

The Texas Court of Civil Appeals has handed down a decision affirming the decision of Judge Munson in favor of Texas Gulf Sulphur in the suit brought by Union Sulphur with regard to the lease of the Chase and Hughes tract, comprising 480 acres on Bolling Dome. This legislation has been in the courts since 1928.

Newport is offering technical resorcin, in the form of flakes which will not solidify in the containers. A subliming process has been perfected by Newport for resorcin which results in a flaky product said to be especially suitable for some branches of the pharmaceutical industry.

Company News

In Penick & Ford, Ltd's., suit against Corn Products Refining, in which the former charged violation of its Widmer patents by the latter, Judge Lindley of United States District Court upheld the Widmer patent in its entirety and held it infringed by the modification by Corn Products Refining Co. Court's decision further held that McCoy patent of the defendant was invalid and ordered dismissal of counter-claims filed by Corn Products.

Liquid Carbonic and Dry Ice have announced that the 10-year contract entered into by the two companies on November 29, 1928, has been terminated as of July 1, 1931.

The By-Prox Laboratories, Ellicott Square Building, Buffalo, a new concern, has taken over the business interests and formulas of Dr. Adolf Neubeck, well-known manufacturer of nickel salts and plating compounds, with uninterrupted service and no variance of formulas. The By-Prox Laboratories will also make other chemical compounds on special formula, handle by-products, and synthetic chemicais.

Patent infringement suit has been filed in U. S. District Court, by United Chromium, Inc., Wilmington, against Chrysler Corp., alleging infringement of two patents covering chromium plating methods. The patents involved were issued to Colin G. Fink, on April 20, 1926, for a process of electro-depositing chromium and preparation of baths and April 28, 1931, for a process of producing chromium plated articles. Mr. Fink assigned the patents to the Chemical Treatment Co., Inc., and the latter assigned them to the Chromium Corp. of America, which corporation later assigned them to United Chromium, Inc.

Murray Oil Products, has been appointed exclusive representative in the metropolitan district of New York and Philadelphia by Vegetable Oil Products Co., Inc., of Los Angeles.

Monsanto has announced the completion of research on pyrocatechol and phthalyl chloride—two new chemicals not hitherto produced in America, and on a small scale only in Germany. Entirely new synthesis developed by Monsanto will make these products available at new low prices to the photographic, dyestuff and other industries.

A wage dividend of $1,008,544.54 has been distributed by Eastman Kodak to employees in Rochester, and to branches and stores throughout the world.

Celotex Co., through joint arrangements with American Hair & Felt Co., Robert Gair Co., Alton Box Board and Paper Co., Compo-Board Co., Kalite Co. and others has completed plans for expansion to include full lines of all types of insulating and acoustical products giving Celotex the following additional items: Ozite building blanket; Lanite insulating quilt; Orange Label wall board; Green Label wall board; Compo-Board; Kalite acoustical plaster and Acousti-Celotex mineral tile.

Bushfield, Inc., founded by Burton T. Bush, for years identified closely with the aromatic chemical trades, has been appointed sole sales agent for Naugatuck Chemical (U. S. Rubber Chemical subsidiary).

International Salt has acquired Independent Salt by purchase of capital stock. Independent Salt Co. is the oldest, largest merchandising concern in the metropolitan district, and the sells "Red Cross" brand of table salt in cartons as well as the various commercial grades for industrial purposes.

Allied with Canadian Industries in a new cellophane enterprise at Three Rivers, Canada, is Imperial Chemical Industries: Canadian Industries has obtained the rights to use patented processes of manufacture to produce cellophane.

Phosphate shipments have been resumed from the Armour Tennessee mines.

P. & G. has purchased the assets of Sabates S. en C., of Havana, Cuba, soap, perfume and candle manufacturers.

American Manganese Steel Co. is nogotiating with Montreal, Que., to erect foundry and plant, according to announcement from City Hall, Montreal.

Equipment

U. S. Stoneware, has just appointed Lloyd C. Cooley its sales representative for the Chicago district. His offices will be located at 75 Wacker Drive.

Seventeen Shriver Filter Presses have just been sold to a leading American rayon manufacturer for immediate installation.

Tank cars, made of aluminum, are being developed by General American Tank Car for shipment of acetic acid, glycerin, formaldehyde and liquids which must be kept in a water-white state and free of steel contamination while in transit. Each car has a capacity of 8,000 gallons.

Chemical Golf Scores

Chemical golf scores are showing definite signs of improvement. At the second golf tournament of the Salesmen's Association at Lennox Hills July 22, G. A. Beauchamp, Merck, was the winner of the low gross prize with 86, and S. C. Benjamin, was runner-up with 87. Third prize was taken by Al Alverez, Grasselli with 92, and George Uhe, was fourth with 95.

The low net prize was won by W. Nevins, of Noil with 69, and Joseph Huisking, of Chas. L. Huisking & Co., was second with 75. E. S. Burke, Jr., was third. In the low net contest for members, Joseph Wrench, Industrial Chemical took first prize with 72, and a 79 by Ira P. MacNair, won the runner-up trophy. Williams Haynes, "Chemical Markets," also scored a 79 but his handicap was larger than Mr. MacNair's and Mr. Haynes was awarded third place. A. J. Higgins, Zinsser was fourth.

The kickers' handicap was won by E. S. Burke, Grant A. Dorland and G. A. Furman, Merck was third. The number chosen in the kickers' contest was 78.

Some of the recent scores made on the metropolitan links during the past month were as follows:

Hackensack (72) Sweepstakes, E. M. Allen, 87-15-72; St. Andrews (71) E. R. Bartlett of Hooker Electrochemical was a prominent member of foursome, winners of the Ball sweepstakes; Lennox Hills, Joseph Wrench (71), 91-16-75.

Muscle Shoals Again

The Muscle Shoals question was revived recently when the President appointed three members to the Federal-Alabama-Tennessee joint commission charged with the duty of trying to find a satisfactory solution to the problem with which Congress has wrestled in vain for the past decade.

The first meeting was held on Aug. 4. As yet it is too early to say what the attitude of the committee as a whole will be towards the broad question of public versus private operation, and whether or not the problem will be treated primarily as a power or a fertilizer question. Statements have been made from both factions. Judson King, director of the National Popular League has already attacked the personnel as being composed entirely of men known as actively hostile to the government, state or federal going into the power business.

Attention is called to a correction to the article, "The Chemical Market in The Plastics Industry", page 27, of the July issue. The two illustrations on page 28 are examples of Aldur Corp's plasticware and not "Beetleware." The caption on page 29 should have read Lumarith instead of Sumarith.

Swasey Donates

J. V. N. Door, president of the United Engineering Trustees, Inc., and Chairman H. Hobert Porter of The Engineering Foundation announced on July 1 that Ambrose Swasey, Founder of The Engineering Foundation, had just added $250,000 to his previous gifts, bringing their total to three-quarters of a million dollars.

Nitrate Education

The Chilean Nitrate Producers' Association was dissolved, June 30, ending its activities which had extended over a period of more than thirty years. In order to continue the activities previously conducted by the Chilean Nitrate of Soda Educational Bureau (which ceased to exist with the dissolution of Nitrate Producers' Association) a Corporation has been chartered under the name of Chilean Nitrate Educational Bureau, Inc., which will function in the same manner as the Chilean Nitrate of Soda Educational Bureau has in the past and with the same personnel.

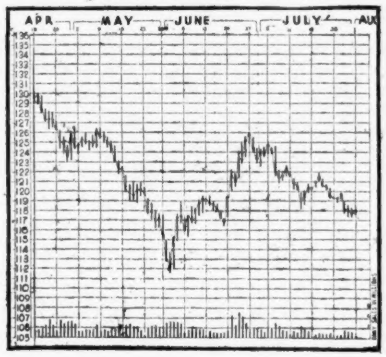
A general review of prohibition enforcement after one year under the Department of Justice was presented July 8, by Amos W. W. Woodcock, Director of Prohibition, in an address delivered over the Columbia Broadcasting System's network.

The Financial Markets

Chemical Stock Prices Sag—Second Quarter Earnings Mostly Favorable—Westvaco Issues Additional Stock—Shawinigan Strengthens Position—A. A. C. Calls Bonds.

June enthusiasm and higher prices gave away in July to further pessimism and lower prices. Buoyed up by the hope extended by the Hoover Plan, the stock market recovered in June practically all the ground lost in May. These gains have largely been dissipated. Held in check by the French attitude, the negotiations in

Daily Record of Stock Market Trend



—*N. Y. Herald Tribune*

Paris were unduly prolonged, and the market was unable to sustain the enthusiasm while the bickering went on. In the middle of the month came the gravest financial peril the world has yet seen and Germany and Austria stood on the brink of bankruptcy. A hurried gathering of international leaders finally arrived at what was termed an agreement, but in effect was merely a compromise. Germany was allowed further extension of its short term obligations, but was refused a long term loan. Whether Germany, by heroic measures can set its financial house in order by purely internal measures, remains to be seen. Interest in foreign news was largely displaced in the last week by the announcement of U. S. Steel's six months earnings, and the reduction of its dividend rate down to $4 a share. The market had largely discounted a $5 rate. A fresh selling wave gripped the street and as the month closed prices were at their lowest point for the entire month. News of the month was decidedly bearish and stocks reflect little hope of further recovery in the next thirty to sixty days.

Chemical Stock Prices

In the chemical list the month was one of declines also. Only one (Commercial Solvents) of the nine companies shown below, picked because of their diversity of interests, made a net gain for the month. Considerable activity was noted in this stock, probably caused by the news of Corn Products buying into the synthetic resin subsidiary of Solvents, the Resinox Corp. Allied was off heavily, losing over 25 points, Air Reduction 12½, du Pont 5 and U. S. I. 5⅜ points. In the absence of any outside encouraging news several companies whose second quarter earnings were more favorable than the first quarter followed the general downward trend.

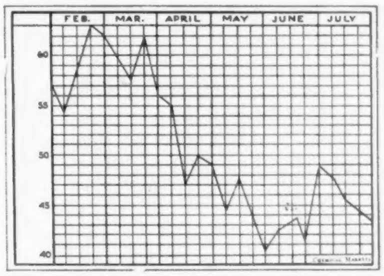
Values Decline

After registering a general appreciation of 15 per cent in June stocks suffered a sharp loss in value in July. The general decline is estimated at seven per cent and only three out of 24 groups registered gains. These were the sugars, leather and drugs.

In the industrial chemical group the loss in 10 representative companies amounted to seven per cent, equal to the average general decline for all groups. The actual depreciation in values was as follows:

Air Reduction	—	$9,149,018
Allied Chemical	—	53,428,658
Comm Solvents	—	4,743,973
Davison	—	1,008,134
du Pont	—	27,664,155
Freeport Texas	—	1,459,566
Math Alkali		unchanged
Texas Gulf Sulphur	—	11,431,800
Union Carbide	—	38,038,283
U. S. Ind. Alcohol	—	794,419
Total depreciation		$138,230,060
Per cent decline		7

Chemical Markets Average Common Stock Price reacted to the uncertainty prevailing in the financial and foreign news, dropping from a high point of 49.51



on July 3 to 43.01 at the close of the month. The Price for the several weeks of July stood as follows: July 3, 49.51; July 10, 47.53; July 17, 45.06; July 24, 44.27; July 31, 43.01. Despite further liquidation, the market held above the low level prevailing during the third week in May.

Highs and lows for chemical and allied stocks were few in number, few lows being registered during July. In the high ground Monsanto broke into the select class on July 22, Nat. Lead pf., on the 20th, American Zinc pf., on the 23rd and United Dyewood pf., on the 7th.

2nd Quarter Earnings

Reports on second quarter earnings in the chemical industry were generally better than anticipated. With only one exception, Monsanto, net profits were less in 1931 than in 1930. An impressive list of companies however, had better earnings for the June quarter indicating a favorable turn in tonnages. Still a comparison is rather misleading. In the alkali group Mathieson earnings were up and Westvaco down, Carbide and Air Reduction just about equaled the first quarter, Atlas Powder and Monsanto improved while American Commercial Alcohol was off.

	1st Quarter a Share	*2nd Ourater a Share*
Air Reduction	$1.21	$1.22
Am. Com Alcohol	.33	loss
Atlas Powder	.04	.39
Com Solvents	.21	.25
Mathieson Alkali	.39	.51
Monsanto	.59	.97
Texas Gulf	.96	.76
Union Carbide	.51	.50
Westvaco	.82	.51

Price Trend of Chemical Company Stocks

Name	*July 3*	*July 10*	*July 17*	*July 24*	*July 31*	*Net Change*
Allied Chem	132	123¾	118	114	106½	—25½
Air Red	86¼	84	76⅝	75¾	74	—12¼
Anaconda	30⅜	25¾	25⅝	25	24⅞	— 5½
Columbian Carbon	81	77½	74 ex. div.	70⅝	66⅝	—14⅜
Comm. Solvents	15¼	17	16⅞	16¼	16⅜	+1 ⅛
Du Pont	92	89½	87½	86	87	— 5
Standard of N. J.	39½	38¾	38	37⅛	37¼	— 2¼
Texas Gulf	37½	35½	35½	33¾	33⅛	— 4⅜
U. S. I.	33¼	31	29	28½	27⅞	— 5⅜

Westvaco Issues Stock

Westvaco has authorized the sale of 59,807 shares of unissued no par value common stock which will be offered to stockholders of record Aug. 10, on the basis of 17 additional unissued shares for each 64 shares held on that date, at $17.50 per share. The issue is being underwritten by Hornblower & Weeks, and associates, including United Chemicals, Inc., for a commission. All stock not subscribed by stockholders will be taken by the underwriters.

Warrants will be mailed to stockholders about Aug. 13, and subscription rights will expire on Sept. 1, 1931. Stock subscribed and paid for on and after Aug. 13, will carry all dividends declared after Sept. 1, 1931.

W. B. Thom, president, in a letter to stockholders said in part: "The Corporation has expended approximately $2,300, 000 during the last two years without outside financing. These expenditures are expected to reduce operating costs $500, 000 per year. The total benefits of these expenditures have not been reflected in the earnings until June 15, of the present year. The purpose of the additional issue of stock is to provide funds to reimburse the treasury for these expenditures and for general corporate purposes."

Libbey-Owens-Ford Co., announce that holders of capital stock July 9, had the right to subscribe at par, plus interest from July 1, for 5% convertible serial notes, due 1933-1938, to the extent of $2.35 par amount in notes for each share held (maturities subject to allotment by company).

Asbestos Cancels Bonds

First mortgage bondholders of Asbestos Corp. of Canada, Ltd., subsidiary of Asbestos Corp., will meet Aug. 21 to vote on cancellation of bonds purchased or called for sinking fund. Only a small amount of the bonds remains outstanding. As alternative, approval is asked for postponement of interest due July 1, 1931, January 1 and July 1, 1932, to January 1, 1933; also postponement of sinking fund installment due January 1, 1932, for one year.

International Printing Ink has filed statement that 2,330 shares 6% cumulative preferred have been redeemed and cancelled, thus reducing stated capital to $9,285,280 from $9,518,280.

Directors of The American Agricultural Chemical Co. voted to call the outstanding bonds of their 7½ per cent mortgage bonds amounting to $5,442,500 be paid Aug. 1, 1931.

Dividends and Dates

Allied Chem	July. 10	$1.50	Aug. 1
Amer. Smelt 2nd pf.	Aug. 7	$1.50	Sept. 1
Amer. Smelt pf.	Aug. 7	$1.75	Sept. 1
Amer. Smelt com.	July 10	.50	Aug. 1
Archer-Daniels pf.	July 21	$1.75	Aug. 1
Atlas Powder pf.	July 20	$1.50	Aug. 1
Col Carbon	July 17	$1.25	Aug. 1
Com Solv	Sept. 10	.25	Sept. 30
Dow Chem	Aug. 1	.50	Aug. 15
Dow Chem pf.	Aug. 1	$1.75	Aug. 15
Freeport	Aug. 15	.75	Sept. 1
Hercules pf	Aug. 4	$1.75	Aug. 15
Heyden Chem	July 15	.50	Aug. 1
Nickel pf	July 2	$1.75	Aug. 1
Liquid Carb.	July 20	.75	Aug. 1
Nat Carb. pf	July 20	$2.00	Aug. 1
Nat Dist. pr	July 15	.50	Aug. 1
N. J. Zinc	July 20	.50	Aug. 10
St. Joe	Sept. 10	.25	Sept. 21
Texas Gulf	Sept. 1	.75	Sept. 15
Va-Car pf	Aug. 17	$1.75	Sept. 1
Westvaco	Aug. 10	.50	Sept. 1

Annual Meeting

	Books Close	Meeting Date
Vanandium	Aug. 15	Sept. 14

Enameling Buys Stock

National Enameling & Stamping Co. has been buying in its own capital stock during the past six or eight months, and has purchased so far more than 25,000 shares. Thus, instead of the 155,918 shares indicated by the December 31, 1930 balance sheet, there now are only about 130,000 shares outstanding.

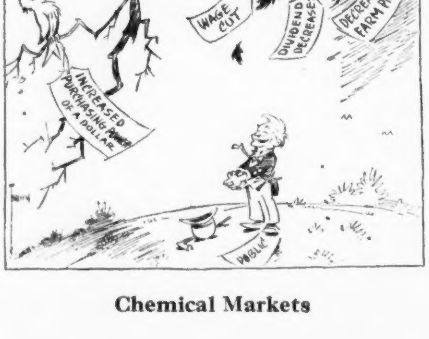
Std. N. J. Stock Price

The Standard of New Jersey has announced a reduction of the subscription price by employes for its common stock for the balance of this year. The new price is to be $34 a share, compared with $47.50 for the first half of 1931, and with a closing price yesterday of 39.

Sherwin-Williams Co. in the fiscal year ending August 31, 1931, will earn as much or more than it did a year ago, according to George A. Martin, president.

BREAKING IN ON THE CROAKING BLUES QUARTET

Copyright, 1931, New York Tribune Inc.



Shawinigan Earnings

Shawinigan Chemicals, Ltd., wholly owned subsidiary of Shawinigan Water & Power and a very important factor in Canadian and American chemical circles, will be in a position to contribute a substantial amount to this year's earnings of the parent company. Through recently improved processes, according to a report from the Wall St. Journal, Montreal Bureau, the chemical subsidiary has strengthened its position further in the sale of a wide range of chemical products, and present contracts assure a successful year. New products, recently developed and now in process of development, will further augment the chemical company's earnings.

Among the latest contracts is one for the delivery of 5,000 tons of artificial resin to a United States furniture manufacturer. Manufacture of artificial resin is likely to become an increasingly important activity of the company, an improved process having recently been discovered.

In 1929, the chemical company's exports totaled $5,000,000, while its employees numbered 1,000 men. During the latter part of 1930, its greatly expanded plants failed to opperate at full capacity, but this year the company started with the bulk of this year's production contracted for, and further contracts since have been obtained.

Proctor & Gamble Corporation in England has been registered as a private company, to have headquarters at Newcastle-on-Tyne. No public ofiering of the stock will be made under these conditions. A combination of P. & G. with Lever Bros., Ltd., of Great Britain would be facilitated by the incorporation just completed.

I. W. E. Armstrong, has announced that he has resigned as president, general manager and chairman of the board of directors, of The Armstrong Chemical Co., Inc. of Canandaigua, N. Y. and is now no way connected with the corporation.

Over the Counter Prices*

	Bid	Asked
Am. Hard Rubber	...	24
Dixon Crucible	115	—125
Dry-Ice	...	30
Merck pf	70	—74
Solid Carbonic	7½	— 9½
Tubize B	*36	—42
Worcester Salt	86	—92

*July 31
†Dividend.

Sherwin-Williams declared the usual extra dividend of 12½c and the regular quarterly dividend of $1 on the common stock, both payable Aug. 15 to stock of record July 31. The regular quarterly dividend of $1.50 on the preferred also was declared, payable Sept. 1 to stock of record Aug. 15.

Company Reports

du Pont's 2nd Quarter Improves

E. I. du Pont de Nemours & Co.'s semi-annual statement issued July 24 reports net income of $27,610,394 for the half year of 1931. Deducting debenture dividends leaves $24,624,404 or $2.23 a share earned on the average number of 11,065,762 shares common stock outstanding, which was $0.23 a share in excess of dividend requirements for the period. Earnings include dividends from General Motors investment amounting to $1.35 a share on du Pont common. In first half of last year, earnings were $2.84 a share on the average number of 10,546,570 shares outstanding, including dividends from General Motors investment of $1.70 on du Pont common, $0.29 of which was an extra dividend. Therefore, the earnings on du Pont common for current half year, exclusive of income from General Motors investment, were $0.88 a share as against $1.14 a share for same period last year.

The Company's earnings for the second quarter of this year, exclusive of income from its investment in General Motors Corporation common stock, as given in the semi-annual statement, show a substantial increase over earnings from the same sources during the first quarter, being $8,277,964 as against $6,503,083.

For first half of 1931, Income from Operations was $11,255,206; Income from Investment in General Motors, $14,971,465; Income from Miscellaneous and Marketable Securities, $2,525,841; after Provision for Federal Income Tax and Interest on Bonds of Subsidiary Companies of $1,142,118, there remained Net Income of $27,610,394.

For first half of last year, Income from Operations was $14,705,317; Income from Investment in General Motors, $17,965,065, including extra dividend of $2,993,600. Income from Miscellaneous and Marketable Securities, $2,025,373; after Provision for Federal Income Tax and Interest on Bonds of Subsidiary Companies of $1,744,441, there remained Net Income of $32,951,314.

Net Income for second quarter of 1931 was $14,953,465. Deducting debenture dividends leaves $13,460,470, or $1.22 a share earned on the average number of 11,065,762 shares common stock outstanding. Earnings include dividends from General Motors investment amounting to $0.675 a share on du Pont common. In second quarter of last year, earnings were $1.33 a share on the average number of 10,629,447 shares outstanding, which included dividends from General Motors investment of $0.70 on du Pont common. Therefore the earnings on du Pont common for current quarter, exclusive of income from General Motors investment, were $0.545 a share as against $0.63 a share for same period last year.

Surplus as of June 30 was $210,581,434 compared with $208,082,665 at December 31, 1930.

Total assets amount to $623,814,942 against $617,699,870 at December 31, 1930. Current assets amount to $123,522,061 including: Cash, $19,947,656; Marketable Securities and Call Loans, $45,615,890; Accounts and Notes Receivable, $23,033,150; and Inventories at or below cost, $34,925,365.

	1931—3 Mos.—1930		*1931—6 Mos. 1930*	
Income from operations	$6,984,627	$7,957,036	$11,255,206	$14,705,317
Inc. from investment in General Motors Corp.	7,487,465	7,484,000	a14,971,465	17,965,065
Inc. from miscellaneous & marketable secs., etc	1,293,337	1,016,591	2,525,841	2,025,373
Total income........	$15,765,429	$16,457,627	$28,752,512	$34,695,755
Prov. for Fed. inc. tax..	793,868	835,773	1,105,885	1,708,063
Net income before interest on bonds......	$14,971,561	$15,621,854	$27,646,627	$32,987,692
Int. on bonds of sub. cos	18,096	18,166	36,233	36,378
Net income.........	$14,953,465	$15,603,688	$27,610,394	$32,951,314
Dividends on deb. stk..	1,492,995	1,492,978	2,985,990	2,985,957
Amount earned on common stock....	$13,460,470	$14,110,710	$24,624,404	$29,965,357
Average no. of shs. of $20 par value com. stock outstanding during the period............	11,065,762	10,629,447	11,065,762	10,546,570
Amount earned a share.	$1.22	$1.33	$2.23	$2.84

Union Carbide Earnings Favorable

Union Carbide & Carbon Corp. and subsidiaries report for quarter ended June 30, 1931, net profit of $4,506,155 after interest, taxes, depreciation and preferred dividends of subsidiaries, equivalent to 50 cents a share on 9,000,743 no-par shares of stock. This compares with $4,613,670, or 51 cents a share, in preceding quarter and $6,306,802, or 70 cents a share, in June quarter of previous year.

For six months ended June 30, 1931, net profit was $9,119,825 after taxes and charges, equal to $1.01 a share on common, comparing with $12,779,585, or $1.42 a share, in first half of 1930.

Consolidated income account for quarter ended June 30, 1931, compares as follows:

	1931	*1930*	*1929*	*1928*
Net af Fd tx..........	$6,640,750	$8,602,073	$9,767,463	$8,210,215
Int & sub pf divs.......	317,466	321,999	307,452	295,241
Depr., etc.............	1,817,129	1,973,272	2,135,714	2,046,364
Net profit..........	$4,506,155	$6,306,802	$7,324,297	$5,868,610

Six months ended June 30:

	1931	*1930*	*1929*	*1928*
Net af Fd tax.........	$13,384,163	$17,357,238	$19,413,963	$16,539,683
Int & sub pf divs......	628,483	630,439	617,204	590,916
Depr., etc.............	3,635,855	3,947,214	4,268,516	4,076,025
Net profit..........	$9,119,825	$12,779,585	$14,528,243	$11,872,742

Earnings at a Glance

Company	*Annual Dividends*	*Net Income 1931*	*Net Income 1930*	*Common Share Earnings 1931*	*Common Share Earnings 1930*
Abbott Laboratories:					
6 mos., June 30..	$2.50	$261,262	$265,718	$1.80	$1.83
Air Reduction Co.:					
June 30, quarter..	3.00	1.026,451	1,360,569	h1.22	h1.72
6 mos., June 30..	3.00	2,045,491	2,883,845	h2.43	h3.64
Amer. Com. Alcohol:					
June 30, quarter..	f...	†167,779	581	...	...
6 mos., June 30..	f...	†42,941	175,931	...	.45
Atlantic Refining Co.					
June 30, quarter..	1.00	†1,850,200	1,694,523	...	h.63
6 mos., June 30..	1.00	†4,013,000	2,818,823	...	p1.05
Atlas Powder Co.:					
June 30, quarter..	4.00	251,829	374,326	.39	.91
6 mos., June 30..	4.00	409,120	725,023	.43	1.74
Colgate-Palmolive-Peet:					
6 mos., June 30..	2.50	4,003,694	3,760,625	1.69	1.66
Commercial Solv.:					
June 30, quarter..	1.00	644,799	747,025	h.25	h.30
6 mos., June 30..	1.00	1,182,343	1,497,517	h.46	h.60
Corn Products:					
June 30, quarter..	§3.00	3,104,888	3,488,918	1.05	1.21
6 mos., June 30..	§3.00	5,494,267	6,641,261	1.82	2.28
Dome Mines Ltd.:					
June 30, quarter..	1.00	e434,343	e40,764	...	...
6 mos., June 30..	1.00	e882,491	e48,923	...	...
du Pont, E. I., de Nemours:					
June 30, quarter..	4.00	14,953,465	15,603,688	1.22	j1.33
6 mos., June 30..	4.00	27,610,394	32,951,314	2.23	j2.84
Freeport Texas Co.:					
6 mos., June 30..	3.00	1,185,092	1,678,561	1.62	2.30
Hercules Powder:					
June 30, quarter..	3.00	519,644	866,933	h.52	h1.10
6 mos., June 30..	3.00	736,103	1,598,468	h.55	h1.99
Johns-Manville Corp.:					
June 30, quarter..	3.00	715,657	998,529	.78	1.16
6 mos., June 30..	3.00	945,767	1,740,160	.91	1.97
Mathieson Alkili Works, Inc.:					
June 30, quarter..	2.00	378,146	565,687	.51	.81
6 mos., June 30..	2.00	675,549	1,107,633	.90	1.57
Penick & Ford:					
June 30, quarter..	1.00	‡284,417	‡384,605	...	...
6 mos., June 30..	1.00	‡631,864	‡1,001,032	...	...
St. Joseph Lead:					
5 mos., May 31..	1.00	†850,819	‡1,307,641	...	...
Texas Gulf Sulphur:					
June 30, quarter..	3.00	1,939,967	3,648,345	.76	1.43
6 mos., June 30..	3.00	4,388,165	7,452,046	1.72	2.93
Union Carbide and Carbon Corp.:					
June 30, quarter..	2.60	4,506,155	6,306,802	.50	.70
6 mos., June 30..	2.60	9,119,825	12,779,585	1.01	1.42
U. S. Indus. Alcohol:					
6 mos., June 30..	f..	†527,287	552,485	...	1.47
U. S. Smelting Ref. & Mining:					
5 mos., May 31..	1.00	757,123	1,401,947	.08	1.12
Westvaco Chlorine Products:					
June 27, quarter..	2.00	153,243	223,439	.51	.82
6 mos., June 27..	2.00	376,682	450,754	1.33	1.66

†Net loss. ‡Profit before federal taxes. fNo common dividend. hOn shares outstanding at close of respective periods. pOn preferred stocks.

U. S. I. Shows 6 Months' Loss

U. S. Industrial Alcohol Co. reports for six months ended June 30, 1931, net loss of $527,286, after depreciation. This compares with net profit of $552,485 after depreciation and federal taxes, equivalent to $1.47 a share on 373,846 no-par shares of capital stock in first half of 1930.

Income account for six months ended June 30, 1931, compares as follows:

	1931	*1930*	*1929*	*1928*
Operating profit.......	$81,362	$1,182,253	$2,528,196	$1,840 023
Depreciation..........	608,649	561,483	600,865	489,905
Federal taxes.........	....	*68,284	231,280	162,014
Net profit..........	loss $527,287	$552,485	$1,696,051	$1,188,104
Preferred dividends....	....	....	....	270,385
Surplus............	loss $527,287	$552,485	$1,696,051	$917,719
Shs. com. stk. out (no par)	373,846	373,846	320,000	240,000
Earnings per share....	Nil	$1.47	$5.30	$3.8

*Not required and returned to earnings.

Westvaco Earns $1.33 a Share

Westvaco Chlorine Products Corp. and subsidiaries for six months ended June 27, 1931, shows net profit of $376,682 after depreciation, federal taxes, etc., equivalent after allowing for dividend requirements on 7% preferred stock, to $1.33 a share on 225,155 no-par shares of common stock. This compares with $450,754 or $1.66 a common share in first six months of 1930.

Net profit for quarter ended June 27, 1931, was $153,243 after depreciation, taxes, etc., equal to 51 cents a share on the common stock, comparing with $223,439 or 82 cents a share on the common stock in preceding quarter and $210,992 or 76 cents a share in second quarter of previous year.

Period End. June 27—	*1931—3 Mos.—1930*		*1931—6 Mos.—1930*	
Net profit after deprec., Federal taxes, etc....	$153,243	$210,992	$376,682	$450,754
Earns. per sh. on 225,155 shs. com. stk. (no par)	$0.51	$0.76	$1.33	$1.66

Atlas Powder Co. and subsidiaries report for six months ended June 30, 1931, net profit of $409,120 after depreciation, federal taxes, etc., equivalent, after dividend requirements on 6% preferred stock, to 43 cents a share on 261,438 no-par shares of common stock. This compares with $725,023 or $1.74 a share, in first half of 1930.

Net profit for quarter ended June 30, 1931, amounted to $251,829 after charges and taxes, equal to 39 cents a share on common comparing with $157,291, or 4 cents a share, in preceding quarter and $374,326, or 91 cents a share, in June quarter of previous year.

Consolidated statement of Atlas Powder Co. for six months ended June 30, 1931, compares as follows:

	1931	*1930*	*1929*	*1928*
Net sales............	$6,515,708	$8,664,190	$11,183,827	$9,704,499
Net profit...........	409,120	725,023	1,194,726	974,869
Pfd divs............	295,919	270,000	270,000	270,000
Balance...........	$113,201	$455,023	$924,726	$704,869
Com divs............	....	522,870	522,870	....
Deficit............	....	$67,847	*$401,856	....

*Surplus

American Commercial Alcohol Corp. reports for quarter ended June 30, 1931, net loss of $167,779 after charges and taxes. This compares with net profit of $124,837, equal to 33 cents a share on 377,544 no-par shares of capital stock in preceding quarter and net profit of $581 in June quarter of previous year.

For six months ended June 30, 1931, net loss totaled $42,941 after charges and taxes, comparing with net profit of $175,931, equal to 45 cents a share on 389,494 shares in first half of 1930.

Colgate-Palmolive-Peet Co. reports for six months ended June 30, 1931, net profit of $4,003,694 after depreciation, interest and federal taxes, equivalent after dividend requirements on 6% preferred stock, to $1.69 a share on 1,999,970 no-par shares of common stock. This compares with $3,760,625 or $1.66 a share in first half of 1930.

Air Reduction's Favorable Quarter

Air Reduction Co., Inc., reports for quarter ended June 30, 1931, net profit of $1,026,451 after depreciation, federal taxes, etc., equivalent to $1.22 a share on 841,288 no-par shares of stock. This compares with $1,019,040 or $1.21 a share on 841,288 shares in preceding quarter and $1,360,569 or $1.72 a share on 791,781 shares in June quarter of 1930.

For six months ended June 30, 1931, net profit totaled $2,045,491 after charges and taxes, equal to $2.43 a share on 841,288 shares comparing with $2,883,845 or $3.64 a share on 791,781 shares in first half of previous year.

Income account for quarter ended June 30, 1931, compares as follows:

	1931	*1930*	*1929*	*1928*
Gross inc.............	$4,320,669	$5,207,553	$5,531,350	$3,721,216
Oper exp.............	2,650,115	3,161,775	3,342,883	2,361,582
Oper. inc...........	$1,670,554	$2,045,778	$2,188,467	$1,359,734
Depr., etc............	518,789	526,187	493,617	485,440
Profit..............	$1,151,765	$1,519,591	$1,694,850	$874,294
Fed tax..............	125,314	159,022	202,078	107,175
Net profit..........	$1,026,451	$1,360,569	$1,492,772	$767,119

Six months ended June 30:

	1931	*1930*	*1929*	*1928*
Gross inc.............	$8,799,684	$10,659,272	$10,263,725	$7,224,838
Oper exp.............	5,464,913	6,406,453	6,237,393	4,647,216
Oper. inc...........	$3,334,771	$4,252,819	$4,026,332	$2,577,622
Depr. etc............	1,038,382	1,039,516	925,288	974,387
Profit..............	$2,296,389	$3,213,303	$3,101,044	*$1,603,235
Fed tax..............	250,898	329,458	370,710	....
Net profit..........	$2,045,491	$2,883,845	$2,730,334	....

*Before federal taxes.

Monsanto Betters 1930 Earnings

The preliminary report of Monsanto Chemical Works for the quarter and six months ended June 30 last, is better even than early June optimistic estimates. Net profit for the quarter of $416,000 roughly, or 97 cents a share on the 429,000 shares, was over 63% above the first quarter, or 59 cents a share, and more than 26.2% above net, the 80 cents a share on 410,307 shares in the June quarter last year.

In the first six months this year, Monsanto's net of $671,378 was 7.8% above the $622,397, for the corresponding period last year. In the second six months of 1930, however, only $110,285 was added to the first half year's profits, bringing net for the year to $732,684, or $1.73 a share on 422,600 shares. This was due almost entirely to big inventory adjustments at the year end. And the same adjustments aided materially the comparison thus far this year.

Penick & Ford, Ltd., Inc., and subsidiaries report for quarter ended June 30, 1931, profit of $284,417 after depreciation, etc., but before federal taxes. This compares with profit of $347,447 in preceding quarter and $384,605 in June quarter of previous year.

For six months ended June 30, 1931, profit before federal taxes was $631,864 against $1,001,032 in first half of 1930.

Consolidated income account for quarter ended June 30, 1931, compares as follows:

	1931	*1930*	*1929*	*1928*
Gross................	$866,078	$1,157,320	$1,106,546	$1,039,623
Expenses.............	422,975	†617,012	547,568	589,133
Depreciation..........	158,686	155,703	183,428	168,290
Interest..............	....	....	19,398	42,564
*Profit.............	$284,417	$384,605	$356,152	$239,636

Six months ended June 30:

	1931	*1930*	*1929*	*1928*
Gross................	$2,018,250	$2,561,603	$2,686,123	$2,081,474
Expense..............	1,062,627	†1,238,284	1,336,090	1,098,762
Depreciation..........	323,759	322,287	349,713	341,328
Interest..............	....	....	50,003	90,547
*Profit.............	$631,864	$1,001,032	$950,317	$550,837

*Before federal taxes. †Includes premium paid on preferred stock purchased for retirement amounting to $64,140 for June quarter and $103,701 for the six months of 1930.

Hercules Net Profit $519,644

Hercules Powder Co. reports for six months ended June 30, 1931, net profit of $736,103 after depreciation and federal taxes, equivalent after dividend requirements on 7% preferred stock, to 55 cents a share on 606,234 no-par shares of common stock. This compares with $1,598,468 or $1.99 a share on 603,079 common shares in first half of 1930.

For quarter ended June 30, 1931, net profit was $519,644 after taxes and charges, equal to 52 cents a share on 606,234 common shares, comparing with $216,459 or three cents a share on 606,234 common shares in preceding quarter and $866,933 or $1.10 a share on 603,079 shares in June quarter of previous year.

On June 30, 1931, surplus amounted to $12,869,425, compared with $13,856,176 on June 30, 1930. Cash and securities amounted to $9,516,697, an increase since January 1, of $843,042.

	1931	*1930*	*1929*	*1928*
Gross receipts	$10,689,392	$14,039,330	$17,243,564	$14,620,378
Net earns. fr. all sources, after deduct. all exps., incident to manuf. & sale, ord. & extraord. repairs, maintenance of plants, accidents, depreciation, etc.	825,713	1,818,188	2,353,574	2,100,918
Fed. inc. tax (estimated)	89,609	219,720	318,036	311,269
Net profits for period	$736,103	$1,598,468	$2,035,538	$1,789,649
Proceeds from sale of cap. stk. in excess of stated value	110,425	177,765	350,000	....
Surpl at beginning of yr	13,329,725	13,380,596	12,863,378	11,682,085
Total surplus	$14,176,253	$15,156,829	$15,248,917	$13,471,734
Preferred dividends	399,844	399,844	399,844	399,844
Common dividends	90,985	900,809	897,000	588,000
Surplus at June 30	$12,869,425	$13,856,176	$13,952,073	$12,483,890
Shs. com. stk. outstand.	606,234	603,079	598,000	147,000
Earnings per share	$0.55	$1.99	$2.74	$9.45

Solvents' Quarter, 25¢ a Share

Commercial Solvents Corp. reports for quarter ended June 30, 1931, net profit of $644,799 after depreciation, federal taxes and reserves, equivalent to 25 cents a share on 2,529,996 shares of no-par common stock. This compares with $537,544 or 21 cents a share on 2,529,873 shares in preceding quarter and $747,025 or 30 cents a share on 2,481,876 shares in June quarter of previous year.

For six months ended June 30, 1931, net profit totaled $1,182, 343 after above charges, equal to 46 cents a share on 2,529,996 shares, comparing with $1,497,517 or 60 cents a share on 2,481, 876 shares in first half of 1930.

Commercial Solvents Corp. has declared the regular quarterly dividend of 25 cents, payable September 30 to stock of record September 10.

	1931	*1930*	*1929*	*1928*
Oper prof	$769,551	$941,342	$1,191,239	$777,021
Other inc	24,916	58,078	115,779	28,129
Total inc	$794,467	$999,420	$1,307,018	$805,150
Other deduct	30,104	27,841	126,965	62,221
Fed tax & res	119,564	*224,554	226,484	117,415
Net profit	$644,799	$747,025	$953,569	$625,514

Six months ended June 30:

	1931	*1930*	*1929*	*1928*
Oper prof	$1,459,835	$1,856,371	$2,320,880	$1,508,709
Other inc	48,789	126,048	163,551	43,231
Total inc	$1,508,624	$1,982,419	$2,484,431	$1,551,940
Other deduct	48,555	54,269	246,030	120,838
Fed tax & res	227,726	*430,633	440,477	229,862
Net profit	$1,182,343	$1,497,517	$1,787,924	$1,201,240

*Includes inventory adjustments.

Abbott Laboratories, excluding earnings of its Canadian subsidiary, reports for six months ended June 30, 1931, net profit of $261,262 after charges, depreciation, and federal taxes, equivalent to $1.80 a share on 145,000 no par shares of capital stock. This compares with combined net profit of Abbott Laboratories and Swan-Myers Co. in first six months of 1930 of $265,718, equal to $1.83 on above number of shares.

Texas Gulf Quarter Off

Texas Gulf Sulphur Co., Inc., reports for quarter ended June 30, 1931, net income of $1,939,967 after depreciation and federal taxes, but before depletion, equivalent to 76 cents a share on 2,540,000 shares of no-par stock. This compares with $2,448,198, or 96 cents a share in preceding quarter and $3,648,345, or $1.43 a share in June quarter of previous year.

Net income for six months ended June 30, 1931, was $4,388,165 before depletion, equal to $1.72 a share against $7,452,046, or $2.93 a share in first half of 1930.

During the last quarter the company increased its reserves for depreciation and accrued federal taxes, by $56,832, making total of these reserves $13,716,716 on June 30, 1931.

Statement for quarter ended June 30, 1931, compares as follows:

	1931	*1930*	*1929*	*1928*
*Net income	$1,939,967	$3,648,345	$3,571,270	$3,586,819
Dividends	1,905,000	2,540,000	2,540,000	2,540,000
Surplus	$34,967	$1,108,345	$1,031,270	$1,046,819
†P & L surp	25,143,810	23,760,607	17,672,613	12,538,122

Six months ended June 30:

	1931	*1930*	*1929*	*1928*
*Net income	$4,388,165	$7,452,046	$7,451,530	$6,674,658
Dividends	4,445,000	5,080,000	5,080,000	5,080,000
Deficit	$ 56,835	‡$2,372,046	‡$2,371,530	‡$1,594,658

*After depreciation and federal taxes. †Including reserve for depletion. ‡Surplus.

Mathieson Nets $675,549 For Half

Mathieson Alkali Works, Inc., reports for quarter ended June 30, 1931, net income of $378,146 after depreciation, depletion, federal taxes, etc., equivalent after dividend requirements on 7% preferred stock, to 51 cents a share on 650,380 shares of no-par common stock. This compares with $297,403, or 39 cents a share, in preceding quarter and $565,687, or 81 cents a share, in June quarter of previous year.

For six months ended June 30, 1931, net income amounted to $675,549 after taxes and charges, equal to 90 cents a share on common comparing with $1,107,633, or $1.57 a share, in first half of 1930.

Income account for quarter ended June 30, 1931, compares as follows:

	1931	*1930*	*1929*	*1928*
Oper profit	$689,168	$922,048	$941,367	$859,340
Depr. & depl	284,681	301,290	257,420	227,897
Profit	$404,487	$620,758	$683,947	$631,443
Other income	10,818	14,891	10,131	*8,697
Total income	$415,305	$635,649	$649,078	$622,746
Federal taxes	37,159	69,962	83,381	66,080
Net income	$378,146	$565,687	$610,697	$556,666

Six months ended June 30:

	1931	*1930*	*1929*	*1928*
Oper profit	$1,294,308	$1,788,460	$1,772,682	$1,595,912
Depr. & depl	569,745	582,929	514,681	453,966
Profit	$724,563	$1,205,531	$1,258,001	$1,141,946
Other income	21,886	35,815	16,821	*22,965
Total income	$746,449	$1,241,346	$1,274,822	$1,118,981
Federal taxes	70,900	133,713	157,451	132,852
Net income	$675,549	$1,107,633	$1,117,371	$986,129

*Debit.

Procter & Gamble Co. for year ended June 30, 1931, shows net profit of $22,650,818 after depreciation, interest, federal taxes, etc., equivalent after preferred dividends to $3.37 a share on 6,410,000 no-par common shares. This compares with net profit, including credit adjustment of prior year's tax reserves amounting to $240,282, or $22,450,600, or $3.37 a common share.

Gross sales for year ended June 30, last, were $190,523,237, against $203,365,610 in preceding fiscal year. Current assets amounted to $86,803,972, and current liabilities $7,147,144, as contrasted with $87,646,446 and $6,452,495, respectively, on June 30, 1930.

The Industry's Stocks

NEW YORK STOCK EXCHANGE

1931 July High	1931 July Low	1931 July Last	1931 High	1931 Low	1930 High	1930 Low	Sales In July	Sales During 1931	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1930	Earnings $-per share-$ 1929
87¾	73¼	74	109⅞	70¾	156⅞	87½	85,600	1,065,600	Air Reduction	No	830,000	$3.00	6.32	7.75
133	105¼	106½	182¾	102¾	343	170½	178,800	1,735,885	Allied Chem. & Dye	No	2,401,000	6.00	9.77	12.60
133¼	124	124	133¼	120¾	126½	120¾	900	9,300	7% cum. pfd.	100	393,000	7.00		76.88
17½	13	13½	29¾	11½	10⅝	1⅝	3,500	46,100	Amer. Agric. Chem.	100	333,000		Yr. Je. '30 Nil	
9	6⅞	6⅞	14½	5⅞	33	9	5,300	154,300	Amer. Com. Alc.	No	389,000		d1.27	3.22
13⅝	9⅝	10⅞	23¾	8⅛	51½	7	8,700	86,300	Amer. Metal Co., Ltd.	No	1,218,000	1.00	1.63	3.23
...	...	...	89½	53½	116	80		1,100	conv. 6% cum. pfd.	100	68,000	6.00		47.53
40⅛	30⅛	31⅞	58⅛	24⅞	79½	37½	81,900	695,395	Amer. Smelt. & Refin.	No	1,830,000	4.00	3.77	10.02
129	120	126½	138⅛	117½	141	131	1,000	11,300	7% cum. pfd.	100	500,000	7.00		43.66
1⅞	1	1⅛	4½	1	22½	2	9,700	25,000	Amer. Solvents & Chem	No	503,000		d2.86	2.56
6	4⅞	5	8¾	3⅜	17⅞	3⅝	3,200	24,400	Amer. Zinc. Lead, & Smelt	25	200,000		d1.46	0.53
41½	39	41½	41½	26¾	79⅞	26¾	2,400	13,000	6% cum. pfd.	25	80,000			7.32
30½	22⅝	24⅞	43¼	18¾	81½	25	528,200	3,839,625	Anaconda Copper Mining	50	8,859,000	2.50	e2.07	8.29
11	9½	9½	18	8	29½	13½	7,400	85,300	Archer Dan. Midland	No	550,000	2.00	Yr. Aug. 30 1.68	
16¾	14¼	14⅞	23⅝	11⅛	51⅝	16⅝	41,200	604,900	Atlantic Refining Co.	25	2,690,000	1.00	1.02	6.20
38	36½	37	54	30	106	42	1,000		Atlas Powder Co.	No	265,000	4.00	2.67	7.66
88	84⅝	88	99⅞	84⅝	106	97	300	2,940	6% cum. pfd.	100	96,000	6.00		28.25
1	⅞	⅞	2	¾	5½	⅞	1,800	17,500	Butte & Sup. Mining	10	290,000			Nil
2¾	2	2	2¾	1⅛	4½	1½	15,000	28,500	Butte Copper & Zinc	5	600,000		Nil	0.34
6½	5	5¾	7¼	2¼	15⅞	2	5,100	64,900	Certain-Teed Products	No	400,000		d7.61	Nil
25¼	22½	25⅛	25¼	8¼	45⅛	6¾	1,400	3,710	7% cum. pfd.	100	63,000			Nil
45½	44	44¾	50½	40	64⅞	44	3,100	63,900	Colgate-Palmolive-Peet	No	2,000,000	2.50	3.76	4.03
82	66⅛	66⅝	111⅝	55	199	65⅛	46,000	452,120	Columbian Carbon	No	499,000	5.00	5.04	7.84
17½	14	16⅜	21½	10¾	38	14	336,300	1,768,890	Comm. Solvents	No	2,530,000	1.00	1.07	1.51
75½	63	64¾	86⅝	55⅝	111⅞	65	62,000	512,100	Corn Products	25	2,530,000	3.00	4.82	5.49
150	147½	150	152¼	146⅞	151½	140	2,820	3,170	7% cum. pfd.	100	250,000	7.00		62.59
15¾	10¾	11	23	9⅝	43⅝	10	20,100	263,300	Davison Chem. Co.	No	504,000		Yr. Je. '30 4.00	
14¾	13¾	13¾	19¼	11	42¾	11½	1,600	20,200	Devoe & Raynolds "A"	No	160,000	1.20	2.24	4.52
106	100	106	109	100	114¾	99	190	610	7% cum. 1st pfd.	100	16,000	7.00		67.59
92¾	83⅞	87	107	71	145¼	80½	233,300	2,736,100	DuPont de Nemours	20	11,014,000	4.00	4.52	6.99
123¼	122½	123⅜	124	118¾	123	114½	1,120	19,820	6% cum. deb.	100	978,000	6.00		78.54
153¾	133½	135⅜	185¾	118	255¼	142⅛	90,400	970,005	Eastman Kodak	No	2,261,000	5.00	8.84	9.57
130⅝	130½	130½	134¼	126	134	120⅞	30	1,130	6% cum. pfd.	100	62,000	6.00		356.89
29	25⅝	26	43¼	22	55½	24½	22,500	668,800	Freeport Texas Co.	No	730,000	4.00	w4.77	5.60
26	18½	19½	47	15¼	71⅛	22⅜	36,700	485,000	General Asphalt Co.	No	413,000	3.00	2.44	4.71
10½	8⅜	9¼	16⅛	7¾	38	7	6,200	162,071	Glidden Co.	No	695,000		Yr. Oct. '30 Nil	
80	64	75	80	60	105⅛	63½	1,030	5,690	7% cum. prior pref.	100	74,000	7.00	Yr. Oct. '30 Nil	
46	45	46	58	40	85	50	400	8,000	Hercules Powder Co.	No	603,000	3.00	2.61	5.95
116	111½	116	119½	111	123¾	116½	890	2,880	7% cum. pfd.	100	114,000	7.00		38.16
35	28	28	86	21½	124	31	14,400	301,700	Industrial Rayon	No	200,000	4.00	7.74	7.26
2⅛	1⅝	2	5¼	1⅝	8½	3⅜	1,700	32,000	Intern. Agric.	No	450,000		Yr. Je. '30 1.68	
18¾	17½	...	51¼	16½	67¼	42¼	200	11,500	7% cum. prior pfd.	100	100,000	7.00	Yr. Je. '30 14.58	
16½	12¼	12½	20⅛	9½	44⅞	12¾	355,100	4,327,500	Intern. Nickel	No	14,584,000	1.00	.67	1.47
36	32¼	33½	42	29¼	45¾	31	9,300	342,500	Intern. Salt	No	240,000	3.00		11.32
61	49¼	50¾	80¾	40⅝	148⅞	48⅞	225,900	2,229,000	Johns-Manville Corp.	No	750,000	3.00	3.66	8.09
15	15	15	16½	10	25	8¾	200	11,300	Kellogg (Spencer)	No	598,000	0.80	h1.14	2.36
32¾	27¾	27¾	55⅛	20⅛	81⅞	39	7,100	183,900	Liquid Carbonic Corp.	No	342,000	4.00	Yr. Sep. '30 5.22	
11¼	8⅝	9½	17	7⅛	37⅜	10½	43,800	243,300	McKesson & Robbins	No	1,073,000	1.00	.96	2.65
33	30	31	37¼	20	49½	25¾	3,600	32,700	conv. 7% cum. pref.	50	428,180	3.50		9.43
19	17	18½	25	16	39¾	20	300	10,200	MacAndrews & Forbes	No	340,000	2.60	2.61	3.13
23⅝	20½	22	31½	17⅝	51⅞	30½	10,900	366,665	Mathieson Alkali	No	650,000	2.00	2.96	3.31
118⅛	114	114	125⅞	112	136	115	120	690	7% cum. pfd.	100	28,000	7.00		93.91
28	23½	27	28	18½	63¾	18⅞	4,700	43,700	Monsanto Chem.	No	416,000	1.25	1.71	4.25
28⅞	24¼	25	36⅞	19¾	39½	18⅛	8,000	278,600	National Dist. Prod.	No	252,000	2.00	1.23	1.42
122	104	104	132	85	189½	114	5,500	66,200	National Lead	100	310,000	5.00	7.58	25.49
141½	140	140	143	135⅝	144	135	280	4,120	7% cum. "A" pfd.	100	244,000	7.00		41.95
120	118	118	120	118	120	116	290	4,120	6% cum. "B" pfd.	100	103,000	6.00		82.47
51	51	51	53	41	85	30	1,000	5,400	Newport $3 cum. conv. "A"	50	33,000	3.00	z5.94	29.79
42⅛	34½	39	46½	28½	55⅞	26⅛	42,400	260,700	Penick & Ford	No	425,000	1.00	4.01	3.97
65	62	64	71¼	56	78⅞	52⅝	10,700	179,700	Procter & Gamble	No	6,410,000	2.40	Yr. Je. '30 3.36	
8¾	6¾	7¾	11⅞	5½	27¼	7⅜	27,500	337,500	Pure Oil Co.	25	3,038,000		.13	1.52
90½	72⅜	86	101⅞	67	114¼	90½	590	7,660	8% cum. pfd.	100	130,000	8.00		22.55
33¾	26⅛	26¾	42⅝	24⅞	56½	36⅞	15,700	274,700	Royal Dutch, N. Y. shs		894,000		2.39	3.35
21¼	16⅛	16⅛	21¼	14¼	57¼	19½	14,400	297,800	St. Joseph Lead	10	1,951,000	2.00	2.09	3.82
7⅞	6	6⅛	10¼	4½	25½	5½	46,800	626,390	Shell Union Oil	No	13,071,000		d.56	1.26
39¼	35¼	36¼	51¾	31⅛	75	42¼	71,200	799,500	Standard Oil, Calif.	No	12,846,000	2.50	2.88	3.63
40⅝	35¼	37½	52½	30⅝	84⅞	43½	255,200	2,760,925	Standard Oil, N. J.	25	25,419,000	1.00	1.65	4.76
18⅞	16	17⅞	26	13⅞	40⅜	19¾	234,500	1,673,655	Standard Oil, N. Y.	25	17,809,000	1.60	.92	2.23
7	6	6	9½	5⅛	17	7¾	1,800	47,300	Tenn. Corporation	No	857,000	1.00	1.21	2.19
24⅝	21¼	23⅛	36¼	18	60½	28¼	75,300	1,405,900	Texas Corp.	25	9,851,000	3.00	1.53	4.91
37⅞	32¼	33⅛	35¾	29⅛	67⅝	40¼	39,300	1,041,900	Texas Gulf Sulphur	No	2,540,000	4.00	5.50	6.40
54¾	48	48⅝	72	43½	106⅞	52½	247,600	2,791,075	Union Carbide & Carb.	No	9,001,000	2.60	3.12	3.94
17	14½	15¼	28¾	13	84	14⅞	10,400	412,500	United Carbon Co.	No	398,000		1.43	1.94
33½	27¾	27⅞	77⅞	24⅝	139⅞	50½	30,000	694,500	U. S. Ind. Alc. Co.	No	374,000	6.00	z2.96	12.63
37½	25⅝	26⅜	76¾	23⅛	143¼	44⅞	525,700	7,263,500	Vanadium Corp. of Amer	No	378,000	3.00	2.95	4.91
1¾	1½	1⅝	3¼	1	8⅞	1⅝	1,600	14,300	Virginia Caro. Chem.	No	487,000		Yr. Je. '30 Nil	
12	12	12	17	7⅛	34½	9	50	14,650	6% cum. part. pfd.	100	213,000		Yr. Je. '30 2.63	
64	61¾	62⅛	72	59¼	82⅞	67½	600	5,700	7% cum. prior pfd.	100	145,000	7.00	Yr. Je. '30 11.96	
27¾	19	19	40	18	59½	18	8,600	65,150	Westvaco Chlorine Prod.	No		2.00	2.51	4.32

h 11 mos. ending Aug. 30

w 13 mos.

z Before inventory adjustment

NEW YORK CURB

1931 July High	1931 July Low	1931 July Last	1931 High	1931 Low	1930 High	1930 Low	Sales In July	Sales During 1931	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1930	Earnings $-per share-$ 1929
5⅛	5	5	5¾	5	13	3⅞	200	2,700	Acetol Prod. conv. "A"	No	60,000			0.42
7½	6¾	...	19½	5	34	16	200	85,625	Agfa Ansco Corp.	No	300,000			Nil
146½	108¼	109	224	90	356	140½	15,525	123,668	Aluminum Amer.	No	1,473,000		z1.93	11.18
104½	95½	...	109⅝	89	111½	104	4,400	21,600	6% cum. pfd.	100	1,473,000	6.00		17.19
65½	55	...	102	40½	232	57½	1,300	11,800	Aluminum Ltd.	No	573,000			4.15
8⅛	6⅞	7⅝	12¾	6⅛	37	6⅝	33,500	461,400	Amer. Cyanamid "B"	No	2,404,000			4.15
8½	5⅛	...	15	5⅛	43⅞	7½	1,100	51,100	Anglo-Chilean Nitrate	No	1,757,000		Yr. Je. '30 Nil	
2¾	1¼	1¼	4	⅝	6½	⅜	2,000	21,706	Assoc. Rayon Corp.	No	1,200,000		Yr. Je. '30 1.87	
...	...	...	60	32¼	60⅜	31½		47,300	conv. 6% cum. pfd.	100	200,000	6.00		

1931 July High	1931 July Low	Last	1931 High	1931 Low	1930 High	1930 Low	Sales In July	Sales During 1931	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1930	1929
1⅜	1¼	...	1⅜	1¼	5¼	1⅜	2,700	21,300	Brit. Celanese Am. Rcts.........	2.43	2,806,000			0.03
65	59	59	65	45½	90	48	400	2,400	7% cum. part. 1st pfd.......	100	148,000	7.00		14.50
81¼	70½	81	81¼	68¼	90	70	1,330	3,410	7% cum. prior pfd.........	100	115,000	7.00		25.70
...	...	...	...	...	20	3½		6,440	Celluloid Corp..................	No	195,000			1.76
...	...	...	9	7¼	13¼	8⅜		3,700	Courtaulds, Ltd................	1£				0.34
45	42	...	51	34	100	49	500	10,700	Dow Chemical....................	No	630,000	2.00	3.44	4.08
64	50½	57	75½	38	166⅞	58¼	16,600	177,900	Gulf Oil..........................	25	4,525,000	1.50		9.83
...	...	...	13	9	23	10½		2,400	Heyden Chemical Corp...........	10	150,000			3.08
...	...	...	3⅛	3⅛	7	4		2,300	Imperial Chem. Ind.............	1£				0.49
...	...	...	...	...	16	3½		100	Monroe Chem....................	No	126,000			2.54
43	39	40	60	36	79½	45	1,200	5,400	Shawinigan W. & P..............	No	2,178,000	2.50		2.35
61	60½	60½	66½	58	85	58	400	6,550	Sherwin-Williams Co............	25	636,000	4.00	Yr. Aug. '30 4.14	
5⅝	4	4⅝	12	3⅞	34½	3⅝	2,800	30,100	Silica Gel Corp................	No	600,000			
28	24	24⅝	38½	19⅛	59⅞	30	119,500	103,000	Standard Oil Ind...............	25	16,851,000	2.50	2.73	4.66
26⅞	25⅝	25⅞	30⅜	24⅛	34½	27	4,800	47,500	Swift & Co......................	25	6,000,000	2.00	2.08	2.18
6½	5	5	16	3⅝	22¾	3	2,200	139,450	Tubize "B"......................	No	600,000	10.00		
									United Chemicals................					
22⅞	20	21	28⅞	14	44	14	1,500	22,700	$3 cum. part. pfd.	No	115,000	3.00		7.66

CLEVELAND

76	76	76	94	76	96	91½	10	1,470	Cleve-Cliffs Iron ,$5 pfd.........	No	498,000	5.00	11.42	
45	42	42	51½	34½	100	48	356		Dow Chemical Co..............	No	630,000	2.00	3.44	4.08
61¾	58¾	60½	68½	53¾	85	57½	773	13,865	Sherwin-Williams Co.............	25	636,000	4.00	Yr. Aug. '30 4.14	

CHICAGO

...	...	...	...	...	46¾	33½			Abbott Labs......................	No	145,000	2.50	3.32	4.92
...	...	...	...	...	15	3⅛			Monroe Chem....................	No	126,000		1.09	2.54
29⅞	26¼	29⅞	33	21	35	15¼	140	1,740	$3.50 cum. pref.............	No	30,000	3.50		13.35
26⅞	25½	26	30½	24½	33¼	27	15,300	39,150	Swift & Co......................	25	6,000,000	2.00	2.08	2.18

CINCINNATI

65	62	64	71	56	110	53⅛	4,434	22,734	Procter & Gamble..............	No	6,410,000	2.40	Yr. Je. '30 3.36	

PHILADELPHIA

...	...	...	81¼	58	100	89		1,900	Pennsylvania Salt...............	50	150,000	5.00	Yr. Je. '30 7.97	

The Industry's Bonds

1931 July High	1931 July Low	Last	1931 High	1931 Low	1930 High	1930 Low	Sales In July	Sales During 1931	ISSUE	Date Due	Int. %	Int. Period	Out-standing $

NEW YORK STOCK EXCHANGE

105⅝	102½	103	105⅝	102½	105½	102	39	563	Amer. Agric. Chem., 1st ref. s. f. 7½s....................	1941	7½	F. A.	7,667,000
89	85	88	99	83¾	100½	93	11	210	Amer. Cyan. deb. 5s..................	1942	5	A. O.	4,554,000
101	96⅞	97¾	102	96¾	177	94⅜	965	2,920	Amer. I. G. Chem. conv. 5½s..................	1949	5½	M. N.	29,933,000
103½	101⅝	103½	104½	101½	104	101	250	2,889	Am. Smelt & Ref. 1st. 5s. "A"..................	1947	5	A. O.	36,578,000
63½	56	58¼	63½	47	98½	67	86	597	Anglo-Chilean s. f. deb. 7s..................	1945	7	M. N.	14,600,000
102	100½	102	103	100½	103	100	57	1,083	Atlantic Refin. deb. 5s..................	1937	5	J. J.	14,000,000
98	97	98	104	97	105½	100¼	34	558	Interlake Iron Corp. 1st 5½s "A"..................	1945	5½	M. N.	6,629,000
105⅝	105	105⅝	105⅝	102	104½	97½	4	83	Corn Prod. Refin. 1st s. f. 5s..................	1934	5	M. N.	1,822,000
50¾	33	..	75½	33	87½	38	292	3,732	Lautaro Nitrate conv. 6s..................	1954	6	J. J.	32,000,000
89	84	89	96	75	100½	87	135	1,093	Pure Oil s. f. 5½% notes..................	1937	5½	F. A.	17,500,000
98	96½	97	103	88	104	93¾	59	624	Solvay Am. Invest. 5% notes	1942	5	M. S.	15,000,000
104⅝	103¼	104⅝	105½	102	104¾	100	1,034	4,961	Standard Oil, N. J. deb. 5s..................	1946	5	F. A.	120,000,000
101	98½	101	106½	97¾	104⅛	96½	541	3,714	Standard Oil, N. Y. deb. 4½s..................	1951	4½	J. D.	50,000,000
96½	90	90	99	88½	102½	90¼	1,225	1,401	Tenn. Corporation deb. 6s. "B"..................	1944	6	M. S.	3,308,000

NEW YORK CURB

105¼	104⅛	...	105½	102¾	104⅞	100⅛	175,000	1,490,000	Aluminum Co., s. f. deb. 5s..................	1952	5	M. S.	37,115,000
97⅝	93¾	97⅝	104¾	93¾	104¼	96⅜	82,000	862,000	Aluminum Ltd., 5s..................	1948	5	J. J.	20,000,000
25	25	25	56	25	60	51	10,000	10,000	Amer. Solv. & Chem. 6½s..................	1936	6½	M. S.	1,737,000
46	43	43	53	43	80	51	28,000	349,000	General Rayon 6s. "A"..................	1948	6	J. D.	5,085,000
102¾	101	102½	103	100	104	90½	263,000	6,077,000	Gulf Oil, 5s..................	1937	5	J. D.	30,414,000
102½	98½	102	104	98½	104	99	392,000	1,818,000	Sinking Fund deb. 5s..................	1947	5	F. A.	35,000,000
100½	93¾	99½	102⅞	93¾	103½	95¼	258,000	1,335,000	Koppers G. & C. deb, 5s..................	1947	5	J. D.	23,050,000
97¾	96	97⅝	98⅜	92⅝	98¾	90⅜	286,000	2,292,000	Shawinigan W. & P. 4½s. "A"..................	1967	4½	A. O.	35,000,000
97¾	96½	97½	98½	96	98¾	90¾	110,000	679,000	4½s., series "B"..................	1968	4½	M. N.	16,108,000
104	103½	103¾	104	102	103½	79½	66,000	573,000	Swift & Co., 5s..................	1944	5	J. J.	22,916,000
103	102⅞	103	104⅛	101	103½	100½	27,000	180,000	Westvaco Chlorine Prod. 5½s..................	1937	5½	M. S.	1,992,000

The Trend of Prices

Important Price Changes

Advances	July	June
Tri-Sodium Phosphate	$ 3.20	$ 3.05
Declines		
Acid Citric, Crystals	$ .35	$ .36
Benzol, pure	.18	.19
Benzol, 90%	.18	.19
Copper Sulfate	3.60	3.70
Quicksilver	90.00	96.00
Resorcin, technical	.65	.90
Sulfate of Ammonia Imported	25.00	26.50
Toluol, commercial	.27	.28
Xylol, commercial	.24	.25

July shipments of industrial chemicals fully reflect the low ebb in business activity and the usual seasonal summer dullness. Producers reported the poorest month for the past eighteen from the tonnage viewpoint. In the last few days of July some increase in inquiries and orders stimulated the belief that August would show some signs of further improvement in demand. As usual there were a few seasonal exceptions, ammonia, calcium chloride, arsenic and copper sulfate were moving into consuming channels at an encouraging rate.

Price reductions continue to overshadow the market. However, for the first time in seventeen months, the Chemical Markets Average Price for twenty representative chemicals held at the level established the previous month. Important declines occured in copper sulfate, in several important intermediates, and in naval stores. Waxes and gums were weaker and several items in the list of fats and oils went to new low levels. Manufacturing operations slowed down as the month wore on and the consensus of opinion in the trade appeared to be that this condition would continue for several weeks.

Chief interest centered in the probable future trend of the nitrogen market. With the exception of sulfate of ammonia, which became highly competitive immediately following the adjournment of the Lucerne meeting, prices were at least nominally held pending more definite news. Already consumers are beginning to speculate on the probable trend of prices in the next contract season. These, it is felt, are dependent upon two factors, the amount of surplus stocks and the speed of recovery in the early fall.

The particularly bad situation in the naval stores industry seemed to have been corrected temporarily when the Federal Government acted to extend further credit. As the month closed prices rallied somewhat, but the industry is faced with the problem of marketing a huge surplus of turpentine and rosin before the next year's production appears. It seems like a most difficult task.

Business activity continues practically unchanged from June levels. Some increase, mostly of a seasonal character, was reported in retail trade, while production dropped slightly. Those manufacturing lines working on fall goods were busy and this fact was encouraging.

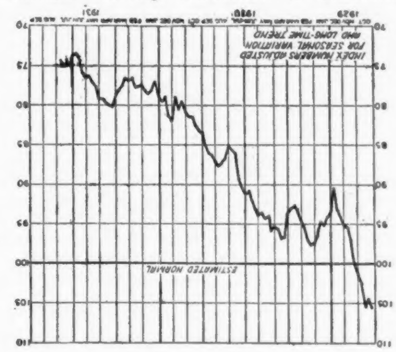
In the commodity markets new record lows were made, cotton, wheat, rubber and copper fell into further declines. Despite this rather pessimistic turn it was thought that August would show greater signs of stabilization. At least, the declines in each instance have not been as severe. The stock market, discounting the foreign situation and the reduction in the steel dividend was weaker and this unquestionably influenced the commodity markets. Economists are generally in agreement that most of the slack has been taken out of surplus stocks of raw commodities and with any definite signs of betterment in wholesale and retail trades prices will go higher.

Prices are at or close to the rock bottom. The National Fertilizer Association weekly wholesale price index-baased on 476 commodities indicates that the downward movement has been halted in most lines of business.

	July 25, '31	*Month Ago*	*Year Ago*
All Groups (14)	68.8	68.7	85.4
Fats and Oils	57.3	56.4	79.7
Chemicals and drugs	86.8	88.7	95.2
Fertilizer materials	76.4	79.8	87.1
Mixed fertilizer	82.7	85.0	96.6

Automobile production was off in July and steel mill operations hovered between 30 and 32 per cent.

The New York Times weekly index of business activity continued to fluctuate

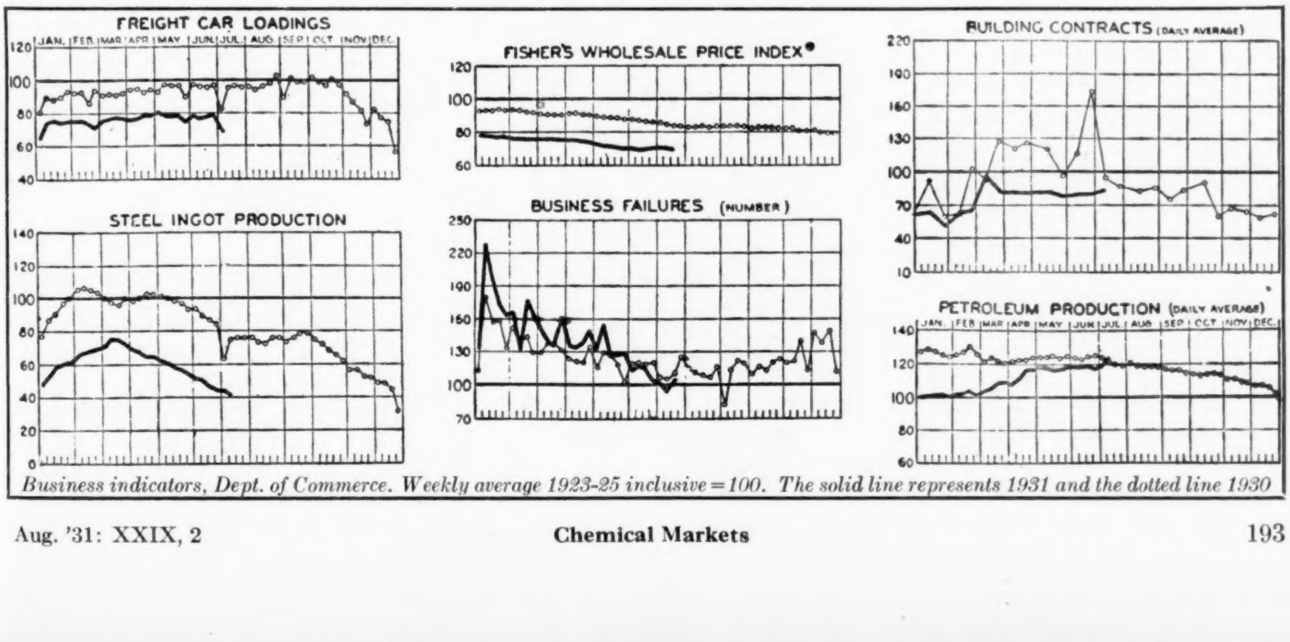


in a narrow range, the preliminary figure for the week ended July 25 showing a return to the July 18 week's level of 74.3 from 74.7 for the preceding week.

Indices of Business

	Latest Available Month	Previous Month	Year Ago
Automobile Production, May	315,115	335,708	420,027
†Brokers Loans, July 1	$1,391	$1,434	$3,727
*Building Contracts, June	$331,879	$306,079	$600,573
*Car Loadings, July 25	763	667	915
†Commercial Paper, May 31	$305	$307	$541
Factory Payrolls, May	75.7	77.1	88.3
*Mail Order Sales, May	$50,070	$52,078	$59,350
Number of Failures, Dun, June	1,993	2,248	2,026
*Merchandise Imports, June	$176,000	$182,000	$250,343
*Merchandise Exports, June	$187,000	$205,000	$294,701
Furnaces in Blast %, July 1	29.0	33.4	50.6
*Steel Unfinished Orders, June 30	3,479	3,620	3,968

*000 omitted. †000,000 omitted.



Business indicators, Dept. of Commerce. Weekly average 1923-25 inclusive = 100. The solid line represents 1931 and the dotted line 1930

Prices Current

Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Naval Stores, Fatty Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Imported chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

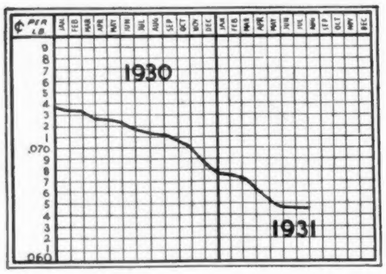
Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - July 1931 $1.43

Average Price at June Level



Chemical Markets Average Price for 20 representative chemicals for the first time in seventeen months held at a previous month's level. The decline in copper sulfate was offset by the stabilizing of trisodium phosphate prices. While declines were numerous generally, only two changes were made in the list of the twenty chemicals that make up the Average Price.

Acid Acetic — Shipments in July were less than in the previous month caused by a further drop in textile activity. With lime stocks still far in excess of immediate needs, no change is price is anticipated for some months.

Acid Citric — The competitive position between foreign and domestic material assumed more threatening proportions during the month. Domestic material was reduced to 35c for crystals and a half cent higher for powdered. (See citric acid market story, page 157).

Acid Sulfuric — The market in this commodity passed through a very dull period with actual shipments at a low point for the year. Consumption in all lines specially the fertilizer has dropped considerably. Fertilizer plants produced a total of 671,710 short tons of sulfuric acid during the first five months of the current year, compared with 949,562 tons in the corresponding period of 1930, and 914,097 tons in the first five months of 1929. Total of acid consumed in fertilizer establishments and shipped to other than fertilizer manufacturers, amounted during the first five months of 1931 to 683,345 short tons, against 1,080,480 tons in the corresponding period of 1930, and 1,006,209 in the first

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Acetaldehyde, drs lc-1 wks...lb.	.18½	.21	.18½	.21	.21	.18½	.21	.18½
Acetaldol, 50 gal dr..........lb.	.27	.31	.27	.31	.31	.27	.31	.27
Acetamide..................lb.	.95	1.35	.95	1.35	1.35	1.20		
Acetanilid, tech, 150 lb bbl...lb.	.20	.23	.20	.23	.23	.21	.24	.21
Acetic Anhydride, 92-95%, 100 lb cbys...............lb.	.21	.25	.21	.25	.29	.25	.35	.28
Acetin, tech drums..........lb.	.30	.32	.30	.32	.32	.30	.32	.30
Acetone, tanks,.............lb.	.10	.10½	.10	.10½	.12	.11	.16	.11
Acetone Oil, bbls NY.......gal.	1.15	1.25	1.15	1.25	1.25	1.15	1.25	1.15
Acetyl Chloride, 100 lb cby...lb.	.55	.68	.55	.68	.68	.55	.68	.45
Acetylene Tetrachloride (see tetrachlorethane).............								
Acids								
Acid Abietic..................	.12	.12	.12	.12	.....	.....	.....	.....
Acetic, 28% 400 lb bbls c-1 wks.............100 lb.	.....	2.60	.....	2.60	3.88	2.60	3.88	3.88
Glacial, bbl c-1 wk.....100 lb.	.....	9.23	.....	9.23	13.68	9.23	13.68	13.68
Glacial, tanks...............	.....	8.98	.....	8.98	13.43	8.98		
Adipic.....................	.72	.72	.72	.72	.....	.....	.....	.....
Anthranilic, refd, bbls........lb.	.85	.95	.85	.95	1.00	.85	1.00	.98
Technical, bbls............lb.	.65	.70	.65	.80	.80	.75	.80	.80
Battery, cbys...........100 lb.	1.60	2.25	1.60	2.25	2.25	1.60	2.25	1.60
Benzoic, tech, 100 lb bbls....lb.	.40	.45	.40	.45	.53	.40	.60	.51
Boric, crys. powd, 250 lb. bbls...................lb.	.06½	.07	.06½	.07¾	.07¼	.06¾	.07¼	.05¾
Broenner's, bbls............lb.	1.20	1.25	1.20	1.25	1.25	1.20	1.25	1.25
Butyric, 100% basis cbys.....lb.	.80	.85	.80	.85	.90	.80	.90	.85
Camphoric.................lb.	.....	5.25	.....	5.25	5.25	5.25	5.25	4.85
Chlorosulfonic, 1500 lb drums wks.................lb.	.04½	.05½	.04½	.05½	.05½	.04½	.05½	.04½
Chromic, 99¾%, drs..........lb.	.14½	.16	.14½	.17	.19	.15	.23	.17½
Chromotropic, 300 lb bbls....lb.	1.00	1.06	1.00	1.06	1.06	1.00	1.06	1.00
Citric, USP, crystals, 230 lb. bbls...................lb.	.....	.35	.35	.43	.59	.40	.70	.46
Cleve's, 250 lb bbls..........lb.	.52	.54	.52	.54	.54	.52	.59	.52
Cresylic, 95%, dark drs NY..gal.	.47	.60	.47	.60	.70	.54	.54	.60
97-99%, pale drs NY.....gal.	.50	.60	.50	.60	.77	.58	.77	.72
Formic, tech 90%, 140 lb. cby...................lb.	.10½	.12	.10½	.12	.12	.10½	.12	.10½
Gallic, tech, bbls............lb.	.60	.70	.60	.70	.55	.50	.12	.50
USP, bbls.................lb.	.....	.74	.....	.74	.74	.74	.55	.74
Gamma, 225 lb bbls wks.....lb.	.77	.80	.77	.80	.80	.77	.80	.74
H, 225 lb bbls wks..........lb.	.65	.70	.65	.70	.70	.65	.99	.80
Hydriodic, USP, 10% soln cby lb.	.....	.67	.....	.67	.67	.67	.72	.67
Hydrobromic, 48%, coml, 155 lb cbys wks.............lb.	.45	.48	.45	.48	.48	.45	.67 .48	.45
Hydrochloric, CP, see Acid Muriatic..................					.....	.....	.....	.....
Hydrocyanic, cylinders wks...lb.	.80	.90	.80	.90	.90	.80	.90	.80
Hydrofluoric, 30%, 400 lb bbls wks...................lb.	.....	.06	.....	.06	.06½	.06	.06	.06
Hydrofluosilicic, 35%, 400 lb bbls wks..............lb.	...11	.12	.11	.12	.12	.11	.11	.11
Hypophosphorous, 30%, USP, demijohns..............lb.	.....	.85	.....	.85	.85	.85	.85	.85
Lactic, 22%, dark, 500 lb bbls lb.	.04	.04½	.04	.04½	.05	.04	.05½	.04½
44%, light, 500 lb bbls......lb.	.11½	.12	.11½	.12	.12	.11	.12½	.11
Laurent's, 250 lb bbls........lb.	.36	.42	.36	.42	.42	.36	.42	.40
Linoleic....................lb.	.16	.16	.16	16	.....	.....	.....	.....
Malic, powd., kegs...........lb.	.45	.60	.45	.60	.60	.45	.60	.48
Metanilic, 250 lb bbls........lb.	.60	.65	.60	.65	.65	.60	.65	.60
Mixed Sulfuric-Nitric..........								
tanks wks..........N unit	.07	.07½	.07	.07½	.07½	.07	.07½	.07
tanks wks..........S unit	.008	.01	.008	.01	.01	.008	.01	.008
Monochloroacetic, tech bbl..lb.	.20	.30	.20	.30	.30	.18	.21	.18
Monosulfonic, bbls..........lb.	1.65	1.70	1.65	1.70	1.70	1.65	1.70	1.65
Muriatic, 18 deg, 120 lb cbys c-1 wks............100 lb.	.....	1.35	.....	1.35	1.35	1.35	1.40	1.35
tanks, wks. 100 lb.		1.00	.....	1.00	1.00	1.00	1.00	1.00
20 degrees, cbys wks...100 lb.	.....	1.45	.....	1.45	....	1.45	....	1.45
N & W, 250 lb bbls............	.85	.95	.85	.95	.95	.85	.95	.85
Naphthionic, tech, 250 lb.......	.....	Nom.	.....	Nom.	Nom.	.....	.59	.55
Nitric, 36 deg, 135 lb cbys c-wks.................100 lb.	.....	5.00	.....	5.00	5.00	5.00	5.00	5.00
40 deg, 135 lb cbys, c-1 wks................100 lb.	.....	6.00	.....	6.00	6.00	6.00	6.00	6.00
Oxalic, 300 lb bbls wks NY...lb.	.11	.11½	.10¾	.11½	.11¾	.11	.11¾	.11
Phosphoric 50%, U. S. P.....lb.	.....	.14	.....	.14	.14	.14	.14	.08
Syrupy, USP, 70 lb drs....lb.	.....	.14	.....	.14	.1	.14	.16	.14
Commercial, tanks,.....Unit.	.....	.80	.....	.80	.80	.80	.....	.....
Picramic, 300 lb bbls........lb.	.65	.70	.65	.70	.70	.65	.70	.65
Picric, kegs.................lb.	.30	.50	.30	.50	.50	.30	.50	.30
Pyrogallic, crystals.......................................lb.	1.50	1.60	1.50	1.60	1.60	1.30	1.40	.86
Salicylic, tech, 125 lb bbl.....lb.	.33	.37	.33	.37	.37	.33	.42	.33
Sulfanilic, 250 lb bbls........lb.	.15	.16	.15	.16	.16	.15	.16	.15
Sulfuric, 66 deg, 180 lb cbys lc-1 wks............100 lb.	1.60	1.95	1.60	1.95	1.95	1.60	1.95	1.60
tanks, wks. ton		15.00	.....	15.00	15.50	15.00	15.50	15.50
1500 lb dr wks......100 lb.	1.50	1.65	1.50	1.65	1.65	1.50	1.65	1.50
60°, 1500 lb dr wks....100 lb.	1.27½	1.42½	1.27½	1.42½	1.42½	1.27½	1.42½	1.27½

★ A RESUME ★

For several years Carbide and Carbon Chemicals Corporation has been producing an ever-increasing number of interesting synthetic organic chemicals. A brief summary of the properties and principal uses of some of these compounds is given below:

Acetone B. P. 56.2° C. A synthetic grade of extremely high purity. A solvent for cellulose esters, acetylene and many other organic and inorganic compounds.

Butyl Cellosolve★ B. P. 170.6° C. A high boiling nitrocellulose solvent possessing a high dilution ratio with petroleum hydrocarbons and giving excellent compatibility with all types of resins. Its miscibility with water and hydrocarbons renders it valuable in dry-cleaning soaps, soluble oils and similar products.

Carbitol★ B. P. 198° C. A solvent with a mild odor and low rate of evaporation. Useful in the manufacture of laminated glass, in soluble oils, wood stains and in the printing and dyeing of textile fabrics. Particularly valuable in the manufacture of cosmetic creams.

Carboxide★ A mixture of Carbon Dioxide and Ethylene Oxide which is highly efficient as a general fumigant. It is non-inflammable. Particularly adapted to the fumigation of foodstuffs, grain, clothing, furs, tobacco and dwellings. Leaves no odor or taste.

Cellosolve★ B. P. 134.8° C. An excellent solvent for nitrocellulose. Practically odorless. High dilution ratio with coal tar hydrocarbons. Useful as a dye solvent in the textile industry.

Cellosolve★ Acetate B. P. 153° C. A "high boiler" with excellent "blush" resistance properties for both cellulose acetate and nitrate lacquers. Practically odorless.

Dichlorethyl Ether B. P. 178° C. A high boiling, stable, chlorinated solvent. Valuable as a constituent of textile scours and boiling out compounds. Suitable for organic syntheses.

Diethylene Glycol B. P. 244.5° C. A colorless, odorless, hygroscopic material useful as a softening and plasticizing agent for textiles, paper, cork glues, etc. A lubricant and dye solvent for the textile industry. Anti-freeze compound for industrial uses.

Dioxan B. P. 100.8° C. A remarkable solvent for cellulose acetate, dyes, fats and other materials. Soluble in organic solvents and completely miscible with water. Pleasant odor.

Ethanolamines — Monoethanolamine B. P. 171° C. Diethanolamine B. P. 271° C. Triethanolamine B. P. 277° C. (150 MM) These compounds are viscous, hygroscopic liquids of very mild odor. They are organic bases of mild alkalinity and react with fatty acids to produce soaps which are useful in dry-cleaning, textile scouring and cosmetics. These soaps are excellent emulsifying agents. Triethanolamine is an excellent absorbent for acid gases.

Ethylene Dichloride B. P. 83.5° C. A low boiling chlorinated solvent which is highly resistant to hydrolysis. It is useful for the extraction of fats and oils, in textile scouring and dry-cleaning operations, and in chemical syntheses. Mixtures of Ethylene Dichloride and alcohol are solvents for cellulose acetate and nitrate.

Ethylene Glycol B. P. 197.2° C. A chemically pure product intermediate in its properties between alcohol and glycerine. Readily nitrated for use in low freezing dynamite.

Ethylene Oxide B. P. 10.5° C. A material of interest in organic syntheses. A valuable fumigant for the destruction of insect pests.

Ethyl Ether B. P. 34.5° C. A synthetic product for industrial extraction processes, recovery of acetic acid from dilute solutions and the manufacture of collodion and cellulose acetate solutions.

Isopropanol 90. 1% B. P. 80.3° C. A synthetic product which parallels ethyl alcohol in many of its properties and suitable for cosmetics, pharmaceutical and industrial uses. Isopropanol is a good solvent for oils, gums and waxes and its acetic ester is a valuable nitrocellulose solvent. Crude Isopropanol has recently been approved for use as an alcohol denaturant.

Isopropyl Ether B. P. 67.5° C. An ether of higher boiling point and lower water solubility than ethyl ether. Useful as a spotting agent in dry-cleaning and extraction processes, recovery of organic acids from dilute solutions and for the dewaxing of oil.

Methanol B. P. 64.7° C. A synthetic product of high purity. Used as a solvent in many industrial applications and for the manufacture of formaldehyde. An excellent anti-freeze material.

Methyl Cellosolve★ B. P. 124.5° C. A solvent of the ether-alcohol type suitable for both cellulose acetate and nitrate lacquers. A good dye solvent. Used for sealing moisture-proof Cellophane.

Triethylene Glycol B. P. 278° C. A high boiling moistening and lubricating agent. Starting material for manufacture of plasticizers.

For detailed information on any of these products address:

CARBIDE AND CARBON CHEMICALS CORPORATION

30 East 42nd Street, New York
230 N. Michigan Avenue, Chicago

Unit of Union Carbide and Carbon Corporation

PRODUCTS MANUFACTURED BY CARBIDE AND CARBON CHEMICALS CORPORATION

ACETONE	ETHYLENE DICHLORIDE
BUTYL CARBITOL★	ETHYLENE GLYCOL
BUTYL CELLOSOLVE★	ETHYLENE OXIDE
CARBITOL★	ISOPROPANOL
CARBOXIDE★	ISOPROPYL ETHER
CELLOSOLVE★	METHYL CELLOSOLVE★
CELLOSOLVE★ ACETATE	METHANOL
DICHLORETHYL ETHER	TRIETHANOLAMINE
DIETHYLENE GLYCOL	TRIETHYLENE GLYCOL
DIOXAN	VINYL CHLORIDE

VINYLITE★ RESINS

ETHYLENE	BUTANE	ISOBUTANE
PROPANE	ETHANE	PROPYLENE
ACTIVATED CARBON		PYROFAX★

★Trade-mark Registered

CM-8-31

Technical Division
Carbide and Carbon Chemicals Corporation
New York, N. Y.

Please send me further information about ____________________
(name of product)

Name ____________________

Company ____________________

Street ____________________

City ____________________ *State* ____________________

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1 00 - 1930 Average $1.161 - Jan. 1930 $1.072 - July 1931 $1.43

five months of 1929. Stocks on hand in May aggregated 95,577 short tons, against 86,196 tons in May of last year and 91,539 tons in May, 1929, department added.

Alcohol — The market continued quiet with consumers holding purchases to immediate needs. Present indications point to an increase of 1c on the new completely denatured formula but as the month closed no definite pronouncement was forthcoming from manufacturers.

Ammonia Anhydrous — The hot sultry weather prevailing in most sections created a heavy demand. Prices remain unaffected, by the nitrogen fertilizer situation.

Ammonia Aqua — Producers noted a drop in shipments in the textile centers, but otherwise reported conditions as favorable. Whether the present uncertainty in nitrogen circles would extend to liquid ammonia was not apparent as the month closed.

Ammonium Sulfate — The break-up of the Lucerne nitrogen conference was the signal for foreign producers, German and English, to lower prices of sulfate in this country. Prices fell almost daily for a week. From reliable sources word came that large tonnages were offered at the rediculously low figure of $23 a ton, Gulf ports. The market steadied slightly in the last week and the open quotation was held at $25 a ton for imported. Domestic producers were not meeting this competition, being satisfied that only a very limited tonnage was available at these prices. Domestic material was lowered to $30 a ton for immediate shipment pending final announcement of next season prices. It must be remembered that of the leading nitrogen fertilizers, it is necessary that the sulfate stocks be moved out first, before either the natural or synthetic material is sold, so that it was quite logical that the first break in the price structure should happen in the sulfate field. The future price trend is uncertain. While the international situation points to open price warfare, there is plenty of logical reasons indicating that before it becomes necessary to announce prices for the year that leading factors will have effected at least a temporary truce. The total output during 1930 of ammonia products in England and Wales expressed as sulfate was 709,231 long tons as compared with 840,483 in 1929 and 549,516 in 1928. Of the 1930 output the equivalent of 51,662 tons was manufactured as concentrated ammoniacal liquor; the balance of 657,569 tons consisted of sulfate, chloride, nitrate, etc. The production of sulfate from liquor produced in gas works was 142,271 long tons as compared with 142,017 in 1929, and

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Oleum, 20%, 1500 lb. drs 1c-1 wks ....ton	.....	18 50	.....	18.50	18.50	18.50	18.50	18.50
40%, 1c-1 wks net ....ton	...	42.00	.....	42.00	42.00	42.00	42.00	42.00
Tannic, tech, 300 lb bbls...lb.	.23	.40	.23	.40	.40	.23	.40	.30
Tartaric, USP, gran. powd, 300 lb. bbls.......lb	.....	.31½	.....	.31½	.38½	.33	.38½	.38
Tobias, 250 lb bbls.........lb.	.....	.85	.....	.85	.85	.85	.85	.85
Trichloroacetic bottles......lb.	.....	2.75	.....	2.75	2.75	2.75	2.75	2.75
Kegs.................lb.	.....	2.00	.....	2.00	2.00	2.00	2.00	2.00
Tungstic, bbls..............lb.	1.40	1.70	1.40	1.70	1.70	1.40	2.25	1.00
Albumen, blood, 225 lb bbls..lb.	.38	.40	.38	.40	.40	.38	47	.38
dark,.............bbls., lb.	.12	.20	.12	20	.20	.12	.20	.12
Egg, edible..............lb.	.....	.60	.55	.60	.75	.55	.83	.70
Technical, 200 lb cases..lb.	.....	.50	.48	.50	.73	.50	.80	.70
Vegetable, edible..........lb.	.60	.65	.60	.65	.65	.60	.65	.60
Technical..............lb.	.50	.55	.50	.55	.55	.50	.55	.50
Alcohol								
Alcohol Butyl, Normal, 50 gal drs c-1 wks..........lb.	.16¼	.17¼	.16¼	.17¼	.18¼	.17¼	.17¾	.17¼
Drums, 1-c-1 wks........lb.	.16¾	.17¾	.16¾	.17¾	.18¾	.17¾	.18½	.17¾
Tank cars wks..........lb.	.15¾	.16¾	.15¾	.16¾	.17¾	.16¾	.17½	.16¾
Amyl (from pentane) Tanks wks............lb.	.....	.203	.203	.236	.236	.236	1.67	1.67
Diacetone, 50 gal drs del..gal.	1.42	1.60	1.42	1.60	1.60	1.42	1.80	1.42
Ethyl, USP, 190 pf, 50 gal bbls..............gal.	2.55	2.65	2.37	2.75	2.75	2.63	2.75	2.69½
Anhydrous, drums.......gal.	.54	.58	.54	.60	.71	.56	.71	.71
No. 5, 188 pf, 50 gal drs. drums extra.........gal.	.27	.29	.27	.44	50	.40	.51	.48
Tank, cars.............gal.	.....	.24	.24	.38	.48	.37	.50	.46
Isopropyl, ref, gal drs.....gal.	.60	.65	.60	1.00	1.00	.60	1.30	1.00
Propyl Normal, 50 gal dr..gal.	.....	1.00	.....	1.00	1.00	1.00	1.00	1.00
Alcotate, tanks............gal.	.....	.60	.60	.60	.....	.....	.....	.....
Aldehyde Ammonia, 100 gal dr lb.	.80	.82	.80	.82	.82	.80	.82	.80
Alpha-Naphthol, crude, 300 lb bbls...................lb.	.60	.65	.60	.65	.65	.60	.65	.65
Alpha-Naphthylamine, 350 lb bbls...................lb.	.32	.34	.32	.34	.34	.32	.34	.32
Alum Ammonia, lump, 400 lb bbls, 1c-1 wks.......100 lb.	3.20	3.50	3.20	3.50	3.50	3.20	3.50	3.25
Chrome, 500 lb casks, wks ....100 lb.	4.50	5.25	4.50	5.25	5.25	4.50	5.50	5.00
Potash, lump, 400 lb casks wks...............100 lb.	3.25	3.50	3.10	3.50	3.50	3.10	3.50	3.00
Soda, ground, 400 lb bbls wks...............100 lb.	3.50	3.75	3.50	3.75	3.75	3.50	3.75	3.75
Aluminum Metal, c-1 NY.100 lb.	22.90	24.30	22.90	24.30	24.30	24.30	24.30	24.30
Chloride Anhydrous,......lb.	.05	.09	.05	.09	.15	.05	.20	.05
Hydrate, 96%, light, 90 lb bbls...................lb.	.16	.17	.16	.17	.18	.16	.18	.17
Stearate, 100 lb bbls.......lb.	.20	.21	.18	.22	.26	.19	.26	25
Sulfate, Iron, free, bags c-1 wks.............100 lb.	1.90	1.95	1.90	1.95	2.05	1.90	2.05	1.95
Coml, bags c-1 wks..100 lb.	1.25	1.30	1.25	1.30	1.40	1.25	1.40	1.40
Aminoazobenzene, 110 lb kegs lb.	.....	1.15	.....	1.15	1.15	1.15	1.15	1.15
Ammonium								
Ammonia anhydrous Com. tanks	.....	.05⅝	.....	.05⅝	.05⅝	.05⅝		
Ammonia. anhyd, 100 lb cyl..lb.	.15½	.15½	.15½	.15½	.15½	.15½	.14½	.14
Water, 26°, 800 lb dr del...lb.	.....	.03½	.....	.03½	.03½	.03½	.03½	.03½
Ammonia, aqua 26° tanks....	.....	.02¾	.02½	.02¾	.02¾	.02½		
Acetate.................lb.	.28	.39	.28	.39	.39	.28		
Bicarbonate, bbls., f.o.b. plant ....100 lb.	.....	5.15	.....	5.15	5.15	5.15	6.50	5.15
Bifluoride, 300 lb bbls......lb.	.21	.22	.21	.22	.22	.21	.22	.21
Carbonate, tech, 500 lb cs..lb.	.10½	.12	.09	.12	.12	.09	.12	.09
Chloride, white, 100 lb. bbls wks.............100 lb.	4.45	5.15	4.45	5.15	5.15	4.45	5.15	4.45
Gray, 250 lb bbls wks....lb.	5.25	5.75	5.25	5.75	5.75	5.25	5.75	5.25
Lump, 500 lb cks spot...lb.	.11	.11½	.11	.11½	.11½	.11	.11½	.11
Lactate, 500 lb bbls.......lb.	.15	.16	.15	.16	.16	.15	.16	.15
Ammonium Linoleate.....lb.	.15	.15	.15	.....	.....	.....	.....	.....
Nitrate, tech, casks........lb.	.06	.10	.06	.10	.10	.06	.10	.06
Persulfate, 112 lb kegs.....lb.	.26	.30	.26	.30	.30	.26	.34	.26
Phosphate, tech, powd, 325 lb bbls..................lb.	.11½	.12	.11½	.12	.13	.11½	.13	.12½
Sulfate, bulk c-1.......100 lb.	1.50	1.60	1.50	1.80	2.10	1.75	2.40	2.05
Southern points.....100 lb.	1.50	1.60	1.50	1.75	2.10	1.82½	2.45	2.05
Nitrate, 26% nitrogen 31.6% ammonia imported bags c. i. f.........ton	34.60	35.00	34.60	35.00	57.60	45.00	60.85	52.40
Sulfocyanide, kegs........lb.	.36	.48	.36	.48	.48	.36	.48	.36
Amyl Acetate, (from pentane) Tanks................lb.	.....	.222	.....	.222	.236	.222	1.70	1.60
Tech., drs................lb.	.225	.236	.225	.236	.24	.225	.24	.23
Alcohol, see Fusel Oil........								
Furoate, 1 lb tins.........lb.		5.00	.....	5.00	5.00	5.00		
Aniline Oil, 960 lb drs........lb.	.14½	.16	.14½	.16	.16	.15	.16½	.15
Annatto, fine...............lb.	.34	.37	.34	.37	.37	.34	.37	.34
Anthraquinone, sublimed, 125 lb bbls..................lb.	.50	.55	.50	.55	.90	.50	.90	.80
Antimony, metal slabs, ton lots ....lb.	.....	.06⅞	.06⅝	.07⅛	.09½	.06½	.10	.08⅝
Needle, powd, 100 lb cs....lb.	.08½	.09	.08½	.09	.09½	.08	.10	.09
Chloride, soln (butter of) cbys..................lb.	.13	.17	.13	.17	.17	.13	.18	.13
Oxide, 500 lb bbls..........lb.	.08½	.08¾	.08½	.08¾	.08¾	.07½	.10	.08⅝
Salt, 66%, tins.............lb.	.22	.24	.22	.24	.24	.22	.26	.24
Sulfuret, golden, bbls......lb.	.16	.20	.16	.20	.20	.16	.20	.16
Vermilion, bbls............lb.	.38	.42	.38	.42	.42	.38	.42	.38
Archil, conc, 600 lb bbls......lb.	.17	.19	.17	.19	.19	.17	.19	.17
Double, 600 lb bbls.........lb.	.12	.14	.12	.14	.14	.12	.14	.12
Triple, 600 lb bbls.........lb.	.12	.14	.12	.14	.14	.12	.16	.12
Argols, 80%, casks..........lb.	.....	.18¾	.....	.18¾	.18¾	.18¾	.18¾	.18¾
Crude, 30%, casks........lb.	.07	.07½	.07	.08	.08	.07¾	.08	.08

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - July 1931 $1.43

145,066 in 1928. The sulfate production at the Billingham atmospheric plant is included with the output of coke ovens, steel works, and producer gas establishments. The total for the group in 1930 was 566,960 compared with 698,466 and 404,450 in the preceding years.

Antimony — The metal slipped to 6.85c with reports from primary sources indicating the strong possibility of making replacements at lower levels. Demand here has been very quiet.

Arabic — Amber sorts were increased ⅛c on July 9 as stocks showed signs of depletion. This gum item is one of a very few in the list to show any bullish price tendencies.

Barium Carbonate — A reduction of $1.50 a ton was affected by leading producers on July 15, bringing the current price down to $56.50 a ton.

Bauxite — Prices on this raw material have been very steady for the past six months, the scale of $5-$6 a ton remaining unchanged. Shipments of bauxite from mines in the United States in 1930 were 330,612 long tons, valued at $1,928,297, a decrease of 10 per cent in quantity and of 15 per cent in total value as compared with 1929, according to a statement of the United States Bureau of Mines, Department of Commerce. In Alabama bauxite was produced in 1930 from the Eufaula and Lennig mines in Barbour County, and the Davis Hill No. 3 mine in Henry County. The shipments were 33 per cent less than in 1929, of which 79 per cent was shipped for use in the chemical industry and the remainder for use in the abrasive industry. Bauxite was produced in Georgia in 1930 at the Hatton and Easterlin mines in Sumter County. Shipments from Georgia in 1930 were 136 per cent more than in 1929, practically all of which was shipped for use in the chemical industry. In 1930 bauxite was produced in Arkansas at four mines—the Sweet Home and Dixie No. 2 in Pulaski County, and the Bauxite and Superior mines in Saline County. Shipments of bauxite from Arkansas in 1930 were 315,273 long tons, a decrease of 10 per cent from 1929. The main production originated in the Saline County field, in which there was a decrease of 5 per cent.

Benzol — Both the pure and the 90% grades were reduced 1c on July 23. Foreign shipments have not increased to relieve the present surplus and consumption continues to lag in this country.

Calcium Chloride — The exceptionally dry weather prevailing in most sec-

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Aroclors, wks....lb.	.20	.40	.20	.40	.40	.20	.....	.....
Arsenic, Red. 224 lb kegs, cs..lb.	.09¾	.10	.09¾	.10	.11	.08¾	.11	.09
White, 112 lb kegs....lb.	.04	.05	.03¾	.05	.04½	.03¾	.04½	.04
Asbestine, c-1 wks....ton	.....	15.00	.....	15.00	15.00	15.00	15.00	4.75
Barium								
Barium Carbonate, 200 lb bags wks....ton	56.50	57.00	56.50	60.00	60.00	58.00	60.00	57.00
Chlorate, 112 lb kegs NY..lb.	.14	.15	.14	.15	.15	.14	.15	.14
Chloride, 600 lb bbl wks...ton	63.00	69.00	63.00	69.00	69.00	63.00	69.00	63.00
Dioxide, 88%, 690 lb drs...lb.	.12	.13	.12	.13	.13	.12	.13	.12
Hydrate, 500 lb bbls....lb.	.04¾	.05½	.04¾	.05½	.05½	.04¾	.05½	.04¾
Nitrate, 700 lb casks....lb.	.07½	.08¼	.07½	.08¼	.08¼	.07½	.08½	.08
Barytes, Floated, 350 lb bbls wks....ton	23.00	24.00	23.00	24.00	24.00	23.00	24.00	23.00
Bauxite, bulk, mines....ton	5.00	6.00	5.00	8.00	8.00	5.00	8.00	5.00
Beeswax, Yellow, crude bags..lb.	.22	.24	.22	.31	.34	.24	.37	.34
Refined, cases....lb.	.26	.28	.26	.37	.38	.37	.42	.39
White, cases....lb.	.....	.36	.34	.36	.53	.34	.53	.51
Benzaldehyde, technical, 945 lb drums wks....lb.	.60	.65	.60	.65	.65	.60	.65	.60
Benzene								
Benzene, 90%, Industrial, 8000 gal tanks wks....gal.	.18	.19	.18	.21	.22	.21	.23	.23
Ind. Pure, tanks works....gal.	.18	.19	.18	.21	.22	.21	.23	.23
Benzidine Base, dry, 250 lb bbls....lb.	.65	.67	.65	.67	.74	.65	.74	.70
Benzoyl, Chloride, 500 lb drs.lb.	.45	.47	.45	.47	1.00	.45	1.00	1.00
Benzyl, Chloride, tech drs....lb.	.....	.30	.....	.30	.25	.25	.25	.25
Beta-Naphthol, 250 lb bbl wk.lb.	.22	.24	.22	.24	.24	.22	.26	.22
Naphthylamine, sublimed, 200 lb bbls....lb.	1.25	1.35	1.25	1.35	1.35	1.25	1.35	1.35
Tech, 200 lb bbls....lb.	.58	.65	.58	.65	.65	.53	.68	.60
Blanc Fixe, 400 lb bbls wks..ton	75.00	90.00	75.00	90.00	90.00	75.00	90.00	75.00
Bleaching Powder								
Bleaching Powder, 300 lb drs c-1 wks contract....100 lb.	2.00	2.35	2.00	2.35	2.35	2.00	2.25	2.00
Blood, Dried, fob, NY....Unit	1.75	1.85	1.75	3.00	3.90	3.00	4.60	3.90
Chicago....Unit	1.50	1.60	1.50	2.35	4.50	2.75	5.00	4.40
S. American shipt....Unit	2.20	2.25	2.20	3.20	4.10	3.15	4.70	4.25
Blues, Bronze Chinese Milori Prussian Soluble....lb.	.....	.35	.....	.35	.35	.35	.35	.32
Bone, raw, Chicago....ton	31.00	32.00	31.00	32.00	39.00	31.00	42.00	39.00
Bone, Ash, 100 lb kegs....lb.	.06	.07	.06	.07	.07	.06	.07	.06
Black, 200 lb bbls....lb.	.05½	.08½	.05½	.08½	.08½	.05½	.08½	.08½
Meal, 3% & 50%, Imp....ton	.....	31.00	.....	31.00	31.00	31.00	35.00	30.00
Borax, bags....lb.	.02¼	.03½	.02¼	.03½	.03½	02½	.03½	.02¼
Bordeaux, Mixture, 16% pwd..lb.	.11½	.13	.11½	.13	.14	.12	.14	.10½
Paste, bbls....lb.	.11½	.13	.11½	.13	.14	.12	.14	.10
Brazilwood, sticks, shpmt....lb.	26.00	28.00	26.00	28.00	28.00	26.00	28.00	26.00
Bromine, cases....lb.	.36	.43	.36	.43	.47	.38		
Bronze, Aluminum, powd blk.lb.	.60	1.20	.60	1.20	1.20	.60	1.20	.60
Gold bulk....lb.	.55	1.25	.55	1.25	1.25	.55	1.25	.55
Butyl, Acetate, normal drs..lb.	.17	.175	.17	.175	.20	.17	.195	.184
Tank, wks....lb.	.16	.175	.16	.175	.186	.16	.186	.181
Aldehyde, 50 gal drs wks...lb.	.34	.44	.34	.44	.44	.34	.70	.34
Carbitol s ee Diethylene Glycol Mono (Butyl Ether)........	.....	.....	.....	.....	.....	.....	.....	.....
Cellosolve (see Ethylene glycol mono butyl ether)........								
Furoate, tech., 50 gal. dr., lb.	.....	.50	.....	.50	.50	.50	.50	.50
Propionate, drs....lb.	.22	.25	.22	.25	.27	.22	.36	.25
Stearate, 50 gal drs....lb.	.25	.30	.25	.30	.30	.25	.60	.25
Tartrate, drs....lb.	.55	.60	.55	.60	.60	.55	.60	.57
Cadmium, Sulfide, boxes....lb.	.65	.90	.65	.90	1.75	.90	1.75	.75
Calcium								
Calcium, Acetate, 150 lb bags c-1....100 lb.	.....	2.00	.....	2.00	4.50	2.00	4.50	4.50
Arsenate, 100 lb bbls c-1 wks....lb.	.07	.09	.07	.09	.09	.07	.09	.07
Carbide, drs....lb.	.05	.06	.05	.06	.06	.05	.06	.05
Carbonate, tech, 100 lb bags c-1....lb.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, Flake, 375 lb drs c-1 wks....ton	.....	22.75	.....	22.75	22.75	22.75	25.00	22.75
Solid, 650 lb drs c-1 fob wks ....ton	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Nitrate, 100 lb bags....ton	40.00	43.00	40.00	43.00	43.00	40.00	52.00	42.00
Peroxide, 100 lb. drs....lb.	.....	1.25	.....	1.25	1.25	1.25	1.25	1.25
Phosphate, tech, 450 lb bbls lb.	.08	.08¾	.08	.08¾	.08¾	.08	.08	.07
Stearate, 100 lb bbls....lb.	.18	.22	.18	.22	.26	.19	.26	.25
Calurea, bags S. points. c.i.f. ton	.....	88.65	.....	88.65	88.65	88.65	88.15	82.15
Camwood, Bark, ground bbls..lb.	.....	.18	.....	.18	.18	.18	.18	.18
Candelilla Wax, bags....lb.	.14	.14½	.13	.15	.20	.15	.24	.22
Carbitol, (See Diethylene Gycol Mono Ethyl Ether)........	.....	.....	.....	.....	.....	.....	.....	.....
Carbon, Decolorizing, 40 lb bags c-1....lb.	.08	.15	.08	.15	.15	.08	.15	.08
Black, 100-300 lb cases 1c-1 NY....lb.	.06	.12	.06	.12	.12	.06	.12	.12
Bisulfide, 500 lb drs 1c-1 NY....lb.	.05½	.06	.05½	.06	.06	.05½	.06	.05½
Dioxide, Liq. 20-25 lb cyl...lb.	.....	.06	.....	.06	.18	.06	.06	.06
Tetrachloride, 1400 lb drs delivered....lb.	.06¼	.07	.06¼	.07	.07	.06¼	.07½	.06¼
Carnauba Wax, Flor, bags....lb.	.26	.28	.26	.28	.37	.28	.43	.35
No. 1 Yellow, bags....lb.	.30	.33	.23	.40	.33	.25	.40	.33
No. 2 N Country, bags....lb.	.....	.17¾	.17¾	.23	.27	.20	.32	.28
No. 2 Regular, bags....lb.	28	.31	.21	.23	.30	.23	.36	.31
No. 3 N. C....lb.	.13½	.14½	.13½	.16	.23	.16	.25	.24
No. 3 Chalky....lb.	.13½	.15	.13½	.15½	.23	.16	.26	.24
Casein, Standard, Domestic.... ground....lb.	.06	.07	.06	.10	.15½	.09½	.17	.15

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1939 Average $1.161 - Jan. 1930 $1.072 - July 1931 $1.43

tions of the country stimulated withdrawals against existing dust-laying contracts and the month compared very favorably with last year. Prices remained firm and unchanged.

Camphor — A fairly active market was reported for powdered. Prices generally were maintained, although some shading on large orders was spoken of in the trade.

Carnauba Wax — Fresh weakness appeared in the market during July, dealers stocks having caught up with the acute shortage of two months ago and in most instances a sizable accumulation over and above immediate consumer requirements forced importers to make price concessions. The market closed as follows, No. 1, 30c; No. 2, 28c; No. 3, N. C. 13½c; No. 3 chalky, 13½c. Most dealers were sanguine of any price rise at least for the next 60 days.

Chlorine — Further improvement in tonnages going into water purification was in evidence, but consumption in other lines is still very much restricted. Chief interest is centering in contract prices for next year. It is known that considerable tonnage is released at the end of this year. Producers maintain that production costs are in excess of present sales prices and that some adjustment is quite possible.

Copper — The metal market again went through a bad month. Each succeeding one seems to have the knack of making the preceding one appear quiet in comparison. Material was offered as low as 7½c in the middle of the month, but at the close, the range stood at 7¾c to 8c. At these prices further curtailment of production is inevitable in addition to that already announced. Leading forecasting agencies were suggesting the advisability of accumulating stocks ahead at existing price levels. Daily average of world production of copper in June was 4,224 tons, compared with 4,209 in May, low of the year, 4,296 in April and 5,023 tons in June, 1930. World total of 781,118 short tons for first half of 1931 compares with production of 919,455 tons of copper in first six months of 1931. The following table gives in short tons output of the several countries for the last months. This is based on fine copper content of blister as reported by smelters without segregation as to countries of origin:

	May 1931	*June 1931*	*Jan.-June 1931*
United States	53,734	51,652	324,051
Mexico	4,078	3,867	24,476
Canada	9,000	9,591	55,704
Chile & Peru	24,812	24,785	146,949
Japan	7,230	6,970	42,768
Australia	1,873	1,296	7,068
Germany	4,459	5,161	32,202
Other Europe	12,300	11,800	72,800
Elsewhere	13,000	11,600	75,100
World's total	130,486	126,722	781,118

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Cellosolve (see Ethylene glycol mono ethyl ether)								
Acetate (see Ethylene glycol mono ethyl ether acetate)								
Celluloid, Scraps, Ivory cs....lb.	.13	.15	.13	.15	.20	.20	.30	.20
Shell, cases....lb.	.18	.20	.18	.20	.20	.18	.20	.18
Transparent, cases....lb.	.....	.15	.....	.15	.15	.15	.32	.15
Cellulose, Acetate, 50 lb kegs . lb.	.80	1.25	.80	1.25	1.25	.80	1.25	1.20
Chalk, dropped, 175 lb bbls...lb.	.03	.03¾	.03	.03¾	.03¾	.03	.03¾	.03
Precip, heavy, 560 lb cks...lb.	.02	.03½	.02	.03½	.03½	.02	.03½	.02
Light, 250 lb casks....lb.	.02½	.03½	.02½	.03½	.03½	.02½	.03½	02½
Charcoal, Hardwood, lump, bulk wks....bu.	.18	.19	.18	.19	.19	.18	.19	.18
Willow, powd, 100 lb bbl wks....lb.	.06	.06½	.06	.06½	.06½	06	.06½	.06
Wood, powd, 100 lb bbls...lb.	.04	.05	.04	.05	.05	04	.05	.04
Chestnut, clarified bbls wks,..lb.	.02	.03	.02	.03	.03	02½	.02	.03½
25% tks wks....lb.	.01¾	.02½	.01¾	.02½	.02½	.01¾	.02½	.01½
Powd, 60%, 100 lb bgs wks.lb.	.....	.04½	.....	.04½	.04½	.04½	04 ½	.04½
Powd, decolorized bgs wks..lb.	.05½	.06	.05½	.06	.06	05½	.06	05½
China Clay, lump, blk mines.ton	8.00	9.00	8.00	9.00	9.00	8.00	9.00	8.00
Powdered, bbls....lb.	.01¾	.02	.01¾	.02	.02	.01¾	.02	.01¾
Pulverized, bbls wks....ton	10.00	12.00	10.00	12.00	12.00	10.00	12.00	10.00
Imported, lump, bulk....ton	15.00	25.00	15.00	25.00	25.00	15.00	25.00	15.00
Powdered, bbls....lb.	.01¾	.03	.01¾	.03	.03	.01¾	.03½	.01¾
Chlorine								
Chlorine, cyls 1c-1 wks contract....lb.	.07	.08½	.07	.08½	.08½	.07	.08½	.07
cyls, cl wks,. contract ...lb.	.04	.04½	.04	.04½	.04½	.04	.04½	.04½
Liq tank or multi-car lot cyls wks contract....lb.	.01¾	.02½	.01¾	.02½	.025	.01¾	.03	.025
Chlorobenzene, Mono, 100 lb. drs 1c-1 wks....lb.	.10	.10½	.10	.10½	.10½	.10	.10½	.08½
Chloroform, tech, 1000 lb drs..lb.	.15	.16	.15	.16	.16	.15	.20	.16
Chloropicrin, comml cyls....lb.	1.00	1.35	1.00	1.35	1.35	1.00	1.35	1.00
Chrome, Green, CP....lb.	.26	.29	.26	.29	.29	.26	.29	.26
Commercial....lb.	.06½	.11	.06½	.11	.11	.06½	.11	.06½
Yellow....lb.	.16	.18	.16	.18	.18	.16	.18	.15
Chromium, Acetate, 8% Chrome bbls....lb.	.04¾	.05¾	.04¾	.05¾	.05¾	.04¾	.05¾	.04¾
20° soln, 400 lb bbls....lb.	.....	.05½	.....	.05½	.05½	.05½	.05½	.05½
Fluoride, powd, 400 lb bbl..lb.	.27	.28	27	.28	.28	.27	.28	.27
Oxide, green, bbls....lb.	.34½	.35½	.34½	.35½	.35½	.34½	.35½	.34½
Coal tar, bbls....bbl	10.00	10.50	10.00	10.50	10.50	10.00	10.50	10.00
Cobalt Oxide, black, bags....lb.	1.35	1.45	1.35	2.22	2.22	2.10	2.22	2.10
Cochineal, gray or black bag..lb.	.52	.57	.52	.57	1.01	.52	1.01	.95
Teneriffe silver, bags....lb.	.....	.57	.55	.57	.95	.54	.95	.95
Copper								
Copper, metal, electrol....100 lb.	7.50	9.00	8.50	10.36	17.78	9.50	24.00	17.00
Carbonate, 400 lb bbls....lb.	.08½	.16½	.08½	.16½	.21½	.08½	.25	.13
Chloride, 250 lb bbls....lb.	.22	.25	.22	.25	.28	.22	.28	.25
Cyanide, 100 lb drs....lb.	.41	.42	.41	.42	.45	.41	.60	.44
Oxide, red, 100 lb bbls....lb.	.15½	.18	.15½	.18	.32	.15½	.32	.16½
Sub-acetate verdigris, 400 lb bbls....lb.	.18	.19	18	.19	.19	.18	.19	.18
Sulfate, bbls c-1 wks...100 lb.	.....	3.60	3.60	4.95	5.50	3.95	7.00	5.50
Copperas, crys and sugar bulk c-1 wks....ton	13.00	14.00	13.00	14.00	14.00	13.00	4.00	13.00
Cotton, Soluble, wet, 100 lb bbls....lb.	.40	.42	.40	.42	.42	.4	.42	.40
Cottonseed, S. E. bulk c-1...ton	.....	26.50	.....	26.50	.....	.....	.....	.....
Meal S. E. bulk....ton	.....	.....	.....	.....	.....	.....	.....	.....
7% Amm., bags mills...ton	37.50	38.00	37.50	38.00	38.00	37.50	38.00	37.50
Cream Tartar, USP, 300 lb. bbls....lb.	.....	.22¾	.22¾	.24½	.27	.24½	.28	26½
Creosote, USP, 42 lb cbys....lb.	.40	.42	.40	.42	.42	.40	.42	.40½
Oil, Grade 1 tanks....gal.	.13	.14	.13	.14	.16	.15	.19	.15
Grade 2....gal.	.11	.12	.11	.12	.14	.13	23	13
Grade 3....gal.	.11	.12	.11	.12	.14	.13	28	13
Cresol, USP, drums....lb.	.13	.17	.13	.17	.17	.14	17	.14
Crotonaldehyde, 50 gal dr....lb.	.32	.36	.32	.36	.36	.32	.36	.32
Cudbear, English....lb.	.16	.17	.16	.17	.17	.16	.17	.16
Cutch, Rangoon, 100 lb bales..lb.	.11	.13	.11	.13	.13	.11	16	.12½
Borneo, Solid, 100 lb bale..lb.	.06½	08½	.06½	.08½	.08½	.06½	08½	.08
Cyanamide, bulk c-1 wks Nitrogen unit....	....	1.10	1.10	1.64	2.00	1.70	2.00	2.00
Dextrin, corn, 140 lb bags.100 lb.	.....	3.72	3.47	4.02	4.82	4.42	4.92	4.62
White, 140 lb bags....100 lb.	3.42	3.67	3.42	4.02	4.77	4.17	4.87	4.57
Potato, Yellow, 220 lb bgs..lb.	.08	.09	.08	.09	.09	08	.09	.08
White, 220 lb bags 1c-1....lb.	.08	.09	.08	.09	.09	.08	.09	.08
Tapioca, 200 lb bags 1c-1...lb.	.08½	.08¾	.08½	.08¾	.08½	.08	.08½	.08
Diamylphthalate, drs wks...gal.	.....	3.80	.....	3.80	3.80	3.80	3.80	3.80
Dianisidine, barrels....lb.	2.35	2.70	2.35	2.70	2.70	2.35	3.10	2.70
Dibutylphthalate, wks....lb.	.24½	.28	.24½	.28	.28	.24½	26½	.26½
Dibutyltartrate, 50 gal drs....lb.	.29½	.31½	.29½	.31½	.31½	.29½	31½	.29½
Dichloroethylether, 50 gal drs lb.	.....	.06	.....	.06	.07	.05	.13	.05
Dichloromethane, drs wks....lb.	.55	.65	.55	.65	.65	55	.65	.55
Diethylamine, 400 lb drs....lb.	2.75	3.00	2.75	3.00	3.00	2.75	3.00	2.75
Diethylcarbonate, drs....gal.	1.85	1.90	1.85	1.90	1.90	1.85	1.90	1.85
Diethylaniline, 850 lb drs....lb.	.55	.60	.55	.60	.60	55	.60	.55
Diethyleneglycol, drs....lb.	.14	.16	.14	.16	.13	10	.13	.10
Mono ethyl ether, drs....lb.	.....	.16	.....	.16	.16	13	.15	.13
Mono butyl ether, drs....lb.	.24	.30	.24	.30	30	.24	.30	.25
Diethylene oxide, 50 gal dr....lb.	.....	.50	.....	.50	.50	50	.50	.50
Diethylorthotoluidin, drs....lb.	.64	.67	.64	.67	.67	.64	.67	.64
Diethyl phthalate, 1000 lb drums....lb.	.24	.26	.24	.26	.26	.24	26	.24
Diethylsulfate, technical, 50 gal drums....lb.	.30	.35	.30	.35	.35	.30	35	30
Dimethylamine, 400 lb drs...lb.	.....	2.62	.....	2.62	2.62	2.62	2.62	2.62
Dimethylaniline, 340 lb drs...lb.	.26	.28	.26	.28	.28	.26	32	26

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - July 1931 $1.43

Copper Sulfate — The fresh decline in the copper market forced sulfate producers to a reduction of 10c a cwt. on July 15. The trend in the price of copper sulfate for the past six months is a splendid example of how the metallic salts are affected by changes in the base metal. Demand for copper sulfate has been exceptionally good for the current year. Actually shipments are close to, if not equal to 1930 which was a good year. Yet, the present price of copper sulfate is the lowest that has prevailed in the memory of most men connected with the industry. Tonnages moved in July were much better than anticipated and carried the agricultural season through to a later date than usual. However, as the month closed, all signs pointed to a sharp ending of demand from this particular quarter. The trade was particularly interested in the report of an addition of 50,000 tons capacity to the Mond plant. With the Montecatini production stepped up to take care of most of the heavy Italian demand, speculation turned on the question as to where this additional tonnage could be marketed. (See editorial, Shifting Copper Sulfate Markets, page 131).

Copperas — With the serious curtailment of steel mill operation has come an acute shortage of copperas and unless some improvement is made in this direction very early in the fall it is quite likely that prices will go higher.

Dimethylaniline — A reduction of 1c was made on July 20, the new price being 25c a lb.

Dyes — Producers report sales quite satisfactory although not as large as May and June. The principal dyeing centers are operating at a fairly active rate and the outlook, specially for dyes suitable for woolens as very favorable. June imports of synthetic dyes totaled 399,213 pounds with an invoice value of $359,117, against 675,058, valued at $576,332, in May and 363,166, valued at $291,793, in June, 1930, according to the monthly report issued jointly by the Department of Commerce and the Tariff Commission. Receipts of synthetic dyes for the first six months of the year totaled 2,429,615 pounds valued at $2,113,623, against 2,195,555, valued at $1,839,417, in the corresponding period a year ago, it is stated.

Egg Albumen — This commodity was reduced to 61c on July 14.

Epsom Salt — Demand in most quarters was good and withdrawals were ahead of the previous month.

Ethyl Acetate — With the automobile industry tapering off for the summer period a further slackening in demand was apparent in the market. While quotations

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Dimethylsulfate, 100 lb drs...lb.	.45	.50	.45	.50	.50	.45	.50	.45
Dinitrobenzene, 400 lb bbls...lb.	.15½	.16½	.15½	.16½	.16½	.15½	.16½	.15
Dintrochlorobenzene, 400 lb bbls.....lb.	.13	.15	.13	.15	.15	.13	.15	.1.
Dinitronaphthalene, 350 lb bbls .....lb.	.34	.37	.34	.37	.37	.34	.37	.34
Dinitrophenol, 350 lb bbls....lb.	.29	.30	.29	.30	.32	.31	.32	.31
Dinitrotoluene, 300 lb bbls...lb.	.16	.17	.16	.17	.18	.16	.19	.17
Diorthotolyguanidine, 275 lb bbls wks.....lb.	.42	.46	.42	.46	.46	.42	.49	.42
Dioxan (See Diethylene Oxide)	.....	.....	.....	.....	...	.....	.....	.....
Diphenyl.....lb.	.20	.40	.20	.40	.50	.20	.50	.40
Diphenylamine.....lb.	.37	.38	.37	.38	.40	.38	.47	.40
Diphenylguanidine, 100 lb bbl lb.	.30	.35	.30	.35	.35	.30	.40	.30
Dip Oil, 25%, drums.....lb.	.26	.30	.26	.30	.30	.26	.30	.26
Divi Divi pods, bgs shipmt..ton	.....	32.00	28.00	35.00	46.50	35.00	57.00	46.50
Extract.....lb.	.05	.05½	.05	.05½	.05½	.05	.05½	.05
Egg Yolk, 200 lb cases.....lb.	.46	.47	.45	.58	.80	.72	.84	.77
Epsom Salt, tech, 300 lb bbls c-1 NY.....100 lb.	1.70	1.90	1.70	1.90	1.90	1.70	1.90	1.70
Ether, USP anaesthesia 55 lb. drs. .....lb.	.....	.23	.23	.28	.28	.21	.39	.38
USP (Conc.).....lb.	.09	.10	.09	.10	.....	.....	.....	.....
Ethyl Acetate, 85% Ester, ... tanks.....lb.	.....	.08	.08	.088	.115	.085	.122	.108
drums.....lb.	.09	.095	.09	.10	.158	.094	.129	.111
Anhydrous, tanks.....lb.	.....	.119	.....	.119	.142	.119		
drums.....lb.	.115	.121	.115	.121	.156	.115		
Acetoacetate, 50 gal drs....lb.	.65	.68	.65	.68	.68	.65	.68	.65
Benzylaniline, 300 lb drs...lb.	.88	.90	.88	.90	1.11	.88	1.11	1.05
Bromide, tech, drums.....lb.	.50	.55	.50	.55	.55	.50	.55	.50
Carbonate, 90%, 50 gal drs gal.	1.85	1.90	1.85	1.90	1.90	1.85	1.90	1.85
Chloride, 200 lb. drums....lb.	.....	.22	.....	.22	.22	.22	.22	.22
Chlorocarbonate, cbys.....lb.	.....	.30	.....	.30	.40	.30	.40	.35
Ether, Absolute, 50 gal drs..lb.	.50	.52	.50	.52	.52	.50	.52	.50
Furoate, 1 lb tins.....lb.	.....	5.00	.....	5.00	5.00	5.00	5.00	5.00
Lactate, drums works.....lb.	.25	.29	.25	.29	.29	.25	.35	.25
Methyl Ketone, 50 gal drs..lb.	.....	.30	.....	.30	.30	.30	.30	.30
Oxalate, drums works.....lb.	.45	.55	.45	.55	.55	.45	.55	.45
Oxybutyrate, 50 gal drs wks.lb.	.....	.30½	.....	.30½	.30½	.30½	.36	.30
Ethylene Dibromide, 60 lb dr .lb.	.....	.70	.....	.70	.70	.70	.70	.79
Chlorhydrin, 40%, 10 gal cbys. chloro. cont.....lb.	.75	.85	.75	.85	.85	.75	.85	.75
Dichloride, 50 gal drums...lb.	.05	.07	.05	.07	.07	.05	.10	.05
Glycol, 50 gal drs wks.....lb.	.25	.28	.25	.28	.28	.25	30	.25
Mono Butyl Ether drs wks.	.25	.27	.25	.27	.27	.23	.31	.23
Mono Ethyl Ether drs wks	.17	.20	.17	.20	.20	.16	.24	.16
Mono Ethyl Ether Acetate dr. wks.....	.19½	.23	.19½	.23	.23	.19	.26	.19
Mono Methyl Ether, drs.lb.	.21	.23	.21	.23	.23	.19	.23	.19
Stearate.....	.18	.18	.18	.18	.....	.....	.....	.....
Oxide, cyl.....lb.	.....	2.00	.....	2.00	2.00	2.00		
Ethylidenaniline.....lb.	.45	.47½	.45	.47½	.47½	.45	.65	.45
Feldspar, bulk.....ton	15.00	20.00	15.00	20.00	25.00	15.00	25.00	20.00
Powdered, bulk works.....ton	15.00	21.00	15.00	21.00	21.00	15.00	21.00	15.00
Ferric Chloride, tech, crystal 475 lb bbls.....lb.	.05	.07½	.05	.07½	.07½	.05	.09	.05
Fish Scrap, dried, wks.....unit	.....	3.00&10	3.00&10	4.25&10	4.35&10	3.90&10	4.25&10	3.65&10
Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis...unit	.....	3.50&50	.....	3.50&50	3.50&50	3.20&50	4.00&50	3.50&50
Fluorspar, 98%, bags.....	41.00	46.00	41.00	46.00	46.00	41.00	46.00	41.00
Formaldehyde								
Formaldehyde, aniline, 100 lb.	.....	.....	.....	....	.....	.....	.....	.....
drums.....lb.	.37½	.42	.37½	.42	.42	.37½	.42	.37
USP, 400 lb bbls wks.....lb.	.06	.07¾	.06	.07¾	.08	.06	.10	.08¼
Fossil Flour.....lb.	.02½	.04	.02½	.04	.04	.02½	.04	.02½
Fullers Earth, bulk, mines..ton	15.00	20.00	15.00	20.00	20.00	15.00	20.00	15.00¼
Imp. powd c-1 bags.....ton	24.00	30.00	24.00	30.00	30.00	24.00	30.00	25.00
Furfural (tech.) drums, wks..lb.	.....	.10	.....	.10	.15	.10	.19½	.17
Furfuramide (tech) 100 lb dr..lb.	.....	.30	.....	.30	.30	.30	.30	.30
Furfuryl Acetate, 1 lb tins....lb.	.....	5.00	.....	5.00	5.00	5.00	5.00	5.00
Alcohol, (tech) 100 lb dr....lb.	.....	.50	.....	.50	.50	.50	.50	.50
Furoic Acid (tech) 100 lb dr...lb.	.....	.50	.....	.50	.50	.50	1.00	.50
Fusel Oil, 10% impurities...gal.	.. ..	1.35	.....	1.35	1.35	1.35	1.35	1.35
Fustic, chips.....lb.	.04	.05	.04	.05	.05	.04	.05	.04
Crystals, 100 lb boxes.....lb.	.20	.22	.20	.22	.22	.20	.22	.20
Liquid, 50°, 600 lb bbls....lb.	.09	10	.09	.10	.10	.09	.10	.09
Solid, 50 lb boxes.....lb.	.14	.16	.14	.16	.16	.14	.16	.14
Sticks.....ton	25.00	26.00	25.00	26.00	26.00	25.00	26.00	25.00
G Salt paste, 360 lb bbls.....lb.	.45	.50	.45	.50	.50	.45	.52	.45
Gall Extract.....lb.	.18	.20	.18	.20	.20	.18	.21	.18
Gambier, common 200 lb cs...lb.	.....	.07	.06½	.07	.07	.06	.07	06
25% liquid, 450 lb bbls....lb.	.08	.10	.08	.10	.10	.08	.14	.08
Singapore cubes, 150 lb bg..lb.	.09½	.09	.09½	.09	.09	.08½	.09	.08½
Gelatin, tech, 100 lb cases....lb.	.45	.50	.45	.50	.50	.45	.50	.45
Glauber's Salt, tech, c-1 wks.....100 lb.	1.00	1.70	1.00	1.70	1.70	1.00	1.70	.70
Glucose (grape sugar) dry 70-80° bags c-1 NY.....100 lb.	3.24	3.34	3.24	3.34	3.34	3.24	3.34	3.20
Tanner's Special, 100 lb bags .....100 lb.	.....	3.14	.....	3.14	3.14	3.14	3.14	3.14
Glue, medium white, bbls...lb.	.22	.24	.22	.24	.24	.20	.24	.20
Pure white, bbls.....lb.	.25	.26	.25	.26	.26	.22	.26	.22
Glycerin, CP, 550 lb drs.....lb.	.....	.11½	.11½	.14½	.14½	.12½	.16	.13½
Dynamite, 100 lb drs.....lb.	.....	.09½	.09½	.12½	.12½	.11	.12½	.10½
Saponification, tanks.....lb.	.....	.06½	.06½	.07½	.08	.07½	.08½	.07½
Soap Lye, tanks.....lb.	.....	.05½	.05½	.07	.07½	.06½	.07½	.06½
Graphite, crude, 220 lb bgs...ton	15.00	35.00	15.00	35.00	35.00	15.00	35.00	15.00
Flake, 500 lb bbls.....lb.	.06	09	.06	.09	.09	.06	.09	.06
Gums								
Gum Accroides, Red, coarse and fine 140-150 lb bags.....lb.	.03½	.04½	.03½	.04½	.04½	.03½	.04½	.03
Powd, 150 lb bags.....lb.	.06	.06½	.06	.06½	.06½	.06	.06½	.06½

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - July 1931 $1.43

remained unchanged it was thought that some shading was being done on worthwhile tonnages. Improvement in the price structure of most of the solvents is not looked for for several months.

Fertilizer Materials — The situation in this branch of the chemical industry is far from good. The unsettled condition of the nitrate situation has forced all factors into a state of waiting. Poor tonnages in the last season is being reflected in price of raw material. During the four-week period ended July 18 the general index number for the prices of fertilizer materials declined 3.2 per cent, the National Fertilizer Association reports. Reductions were noted in the prices for sulfate of ammonia, superphosphate, ground bone, cyanamid, cottonseed meal and tankage, while the price for potash salts was slightly higher than a month ago, due to the elapsed discount period. The group of fertilizer materials showed a reduction of 11.7 per cent during the last twelve months. During the latest four-week period the index number for mixed fertilizer also declined 3.2 per cent. The index number for the fourteen analyses of mixed fertilizer contained in this group, based on the five-year average 1910 to 1914 as 100 now stands at 89.9. During the last twelve months the index number for mixed fertilizer has declined 15.7 per cent, while the index number for fertilizer materials has declined 11.7 per cent.

Glaubers Salt — The tanning trade was taking fair quantities of imported. Silk dyeing operations were off from the high of two months ago, causing a drop in crystal, but dye producers were reported as absorbing large quantities of the anhydrous. The price structure for all grades remained unaltered.

Glycerine — In the absence of any activity either by producers or buyers the market drifted during the month with prices generally maintained at the levels reached in June. Most consumers are said to have covered requirements for the next three months.

Glues — The market was rather weak during the past month and large orders were reported as gaining worthwhile concessions.

Japan Wax — In sympathy with the lower prices generally prevailing for waxes, Japan sank to a new low for the year, 9c. The previous record low was 9½c, made early in the year previous to the abortive rise in the wax market two and a half months ago. Dealers could point to no good reason for any immediate change in present market conditions.

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Yellow, 150-200 lb bags....lb.	18	.20	.18	.20	.20	.18	.20	.'8
Animi (Zanzibar) bean & pea 250 lb cases..............lb.	.35	.40	.35	.40	.40	.35	.10	.35
Glassy, 250 lb cases.......lb.	.50	55	.50	.55	.55	50	55	50
Asphaltum, Barbadoes (Manjak) 200 lb bags.............lb.	.09	.12	.09	.12	.12	09	12	09
Egyptian, 200 lb cases.......lb.	.15	.17	.15	.17	.17	15	.17	15
Gilsonite Selects, 200 lb bags ....ton	58.00	65.00	58.00	65.00	65 00	58 00	65.00	58 00
Damar Batavia standard 136, lb cases.................lb.	.10	.10½	.11½	.13	.20	14	.26	.22
Batavia Dust, 160 lb bags.....lb.	.05	.05½	.05½	.06	.11	06	1'	'10½
E Seeds, 136 lb cases.......lb.	.06	.06½	.07	.08	.13	.08	17½	15
F Splinters, 136 lb cases and bags....................lb	.05½	.06	.06½	.07½	.13½	.07	.13½	1"
Singapore, No 1, 224 lb cases lb.	.15	.15½	.13½	.15	24	.18½	30½	26
No. 2, 224 lb cases........lb.	.08	.08½	.08½	.10	20½	13	24	21'
No. 3, 180 lb bags.........lb.	.04½	.05	.05	.06	11½	.07	.14	.10
Benzoin Sumatra, U. S. P. 120 lb cases..................lb.	.28	.30	.28	.34	.40	.33	.40	.3 .
Copal Congo, 112 lb bags, clean opaque.................lb.	.16½	.17	.16	.17	.17	16	17	14
Dark, amber..............lb.	.06	.07	.06½	.07½	.08	07¾	09	08¾
Light, amber.............lb.	.12½	.14	.12½	.14	.14	12½	14	.12½
Water white..............lb.	.37	.45	.37	.45	.45	37	.36	.35
Mastic....................lb.	.50	.52	.48	.58	.65	.57	65	.58
Manila, 180-190 lb baskets								
Loba A...................lb.	.10	.11	.11	.13	.17½	.13	.17½	.17
Loba B...................lb.	08	.08½	.09	.10½	.16½	.13½	.16½	15½
Loba C...... ....lb.	.07½	.08	08½	10	14	.10	.14½	.13½
M A Sorts...............lb.	05	.05½	05½	.06½	.....	.....	.....	.....
D B B Chips.............lb.	.06	.06½	07	.08	.....	.....	.....	.....
East Indies chips, 180 lb bags lb.	05	.05½	.05	.05½	.11	.09	11	10
Pale bold, 224 lb cs......lb.	.15½	.16	.15½	.16	.21	.17½	21	20
Pale nubs, 180 lb bags....lb,	.08	.08½	.08	.09	.16	.12½	.16	1..
Pontianak, 224 lb cases....								
Bold gen No 1......... lb.	.15½	.16	.16	.17	.21	.19	23	20
Gen chips spot..........lb.	.07	.08	.07	.08½	.15	.13½	15	.14½
Elemi, No. 1, 80-85 lb cs...lb.	.09	.09½	.10	.12	.14	.12½	14	.13½
No. 2, 80-85 lb cases.....lb.	.08½	.09	.09½	.11½	.13½	.12	13½	.13
No. 3, 80-85 lb cases.....lb.	.08	.08½	.08½	.11	.13	.11	.13	.12
Kauri, 224-226 lb cases No. 1	.42	.48	.43	.50	.57	.48	.57	.50
No. 2 fair pale..........lb.	.24	.25	.26	.29	.38	.32	.38	.35
Brown Chips, 224-226 lb cases................lb.	.10	.12	.10	.12	.12	.10	.12	.10
Bush Chips, 224-226 lb. cases................lb.	.26	.28	.28	.34	.40	.38	.40	.3:
Pale Chips, 224-226 lb cases ....lb.	.19	21	.19	.22	.26	.24½	.26	.24½
Sandarac, prime quality, 200 lb bags & 300 lb casks...lb	.18	.20	.18	.22	.40	.27	.72	.35
Helium, 1 lit. bot. ....lit.	.....	25.00	.....	25.00	25.00	25.00	20	.17
Hematine crystals, 400 lb bbls lb.	.14	.18	.14	.18	.18	.14	.20	.14
Paste, 500 bbls............lb.	.....	.11	.....	.11	.11	.11	.11	.11
Hemlock 25%, 600 lb bbls wks lb.	.03	.03½	.03	.03½	.03½	.03	.03¾	.03
Bark....................ton	.....	16.00	.....	16.00	16.00	16.00	17.00	16 00
Hexalene, 50 gal drs wks......lb.	.....	.60	.....	.60	.60	.60	.60	.60
Hexamethylenetetramine, drs.lb.	.46	.50	.46	.50	.50	.46	.58	48
Hoof Meal, fob Chicago....unit	.....	2.50	.....	2.50	3.75	2.50	4.00	3.75
South Amer. to arrive....unit	.....	2.70	.....	2.70	3.75	2.70	3.90	3.75
Hydrogen Peroxide, 100 vol, 140 lb cbys................lb.	.21	.24	.21	.24	.26	.21	.26	.24
Hydroxyamine Hydrochloride lb.	.....	3.15	.....	3.15	3.15	3.15		
Hypernic, 51°, 600 lb bbls....lb.	.12	.15	.12	.15	.15	.12	15	.12
Indigo Madras, bbls.........lb.	1.28	1.30	1.28	1.30	1.30	1 28	1 30	1.28
20% paste, drums.........lb.	.15	.18	.15	.18	.18	.15	18	.15
Synthetic, liquid..........lb.	.....	.12	.....	.12	.12	.12	12	.12
Iron Chloride, see Ferric or Ferrous								
Iron Nitrate, kegs...........lb.	.09	.10	.09	.10	.10	.09	10	.09
Coml, bbls..........100 lb.	2.50	3.25	2.50	3.25	3.25	2.50	3 25	2.50
Oxide, English..........lb.	.10	.12	.10	.12	.12	.10	.12	.10
Red, Spanish...........lb.	.02½	.03¼	.02½	.03¼	.03¼	.02½	.03¼	.02¼
Isopropyl Acetate, 50 gal drs gal.	.85	.90	.85	.90	.90	.85	.90	.85
Japan Wax, 224 lb cases......lb.	.09	10	.09	.11	.15½	.11½	.18	.16
Kieselguhr, 95 lb bgs NY.......								
Brown.................ton	60.00	70.00	60.00	70.00	70.00	60.00	70.00	60.00
Lead Acetate, bbls wks...100 lb.	9.50	10.00	9.50	11.00	13.50	10.50	13.50	13 00
White crystals, 500 lb bbls wks................100 lb.	.....	11.00	10.50	12.25	14.50	11.50	14 50	14.00
Arsenate, drs 1c-1 wks.....lb.	.11	.13	.11	.14	.16	.13	.15	.13
Dithiofuroate, 100 lb dr....lb.	.....	1.00	.....	1.00	1.00	1 00		
Metal, c-1 NY.........100 lb.	.....	4 40	3.75	4.60	7 75	5.10	7 75	6 10
Nitrate, 500 lb bbls wks....lb.	.13	.14	.13	.14	14	.13	.14	14
Oleate, bbls..............lb.	.17½	.18	.17½	.18	18	.17½	18	.17½
Oxide Litharge, 500 lb bbls.lb.	.07¼	.08	.07¼	.08	08¾	.08¼	08¾	08¾
Red, 500 lb bbls wks....lb.	.07¾	.08¼	.07¾	.08¼	09¾	.08¾	09¾	09¾
White, 500 lb bbls wks...lb.	.07¼	.08	.07¼	.08	09½	.07¼	09¾	09
Sulfate, 500 lb bbls wk...lb.	.06¾	.07	.06¾	.07	.08¾	.06¾	.08¾	.08½
Leuna saltpetre, bags c.i.f....ton	.....	57.60	.....	57.60	57 60	57.60	57.00	52.00
S. points c. i. f............ton	.....	57.90	.....	57.90	57 90	57 90	57 30	52.30
Lime, ground stone bags.....ton	.....	4.50	.....	4.50	4 50	4.50	4 50	4.50
Live, 325 lb bbls wks...100 lb.	.....	1.05	.....	1.05	1 05	1.05	1.05	1.05
Lime Salts, see Calcium Salts								
Lime-Sulfur soln bbls........gal.	.15	.17	.15	.17	.17	.15	.17	.15
Lithopone, 400 lb bbls 1c-1 wks ....lb.	.04¾	.05	.04¾	.05	.05¾	.04¾	.06½	.05¾
Logwood, 51°, 600 lb bbls.....lb.	.07	.08	.07	.08	.08½	.07	.08½	.08½
Chips, 150 lb bags.........lb.	.03	.03½	.03	.03½	.03½	.03	.03½	.03
Solid, 50 lb boxes.........lb.	.12	.12½	.12	.12½	.12½	12½	.12½	.12½
Sticks....................ton	24.00	26.00	24.00	26.00	26.00	24 00	26.00	24.00
Lower grades.............lb.	.07½	.08	.07½	.08	.08	.07½	.08	.07½
Madder, Dutch..............lb.	.22	.25	.22	.25	.25	.22	.25	.22
Magnesite, calc, 500 lb bbl...ton	50.00	60.00	50.00	60.00	60.00	50.00	60.00	50.00

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - July 1931 $1.43

Lead — The metal market moved within very narrow limits during the month with prices in the same position at the close as at the opening of the month. Market authorities were pointing to the advisability of some forward buying covering the next 60 days but seemed to expect a further recession before 1932. Undoubtedly the belief that it was advisable to cover for immediate needs was influenced by a drop in world production figures for June. World production of lead in June was 120,240 short tons compared with 123,639 tons in May 131,926 tons in April and 150,541 tons in June, 1930. While total output for the month was down, average daily tonnage was slightly higher with 4,008 tons a day in June compared with 3,988 tons in May, lowest for the year, 4,398 in April and 5,018 in June, 1930. Total production for the first six months was 807,244 tons compared with 926,837 tons in first six months of 1930. Following table gives in short tons world production of lead assigned to countries of origin of the ore so far as American Bureau of Metal Statistics has been able:

	May	*June*	*Jan.-June*
United States	39,519	30,708	230,369
Canada	11,345	11,262	73,734
Mexico	18,426	21,093	131,250
Germany	7,918	10,097	60,358
Italy	2,302	1,941	13,167
Spain and Tunis*	7,102	7,987	53,290
Europe	16,000	16,100	107,800
Australia	13,129	13,037	86,683
Burma	6,698	6,815	43,573
Elsewhere	1,200	1,200	7,200
World's total	123,639	120,240	807,424

Mercury — With the collapse of the foreign cartel, prices skidded further during the past month and sales were made at $90.00 a flask. It is hardly possible that any upward revision can take place with stocks on hand as large as they are reported. Until such time as the market absorbs this quantity the market is in a weak statistical position.

Quicksilver production in the United States in 1930 totaled 21,553 flasks, valued at $2,478,789, being a decline of 9 per cent in quantity and 14 per cent in value as compared with 1929, when the output was 23,682 flasks, valued at $2,892,638, according to the United States Bureau of Mines, which reported that the average quoted price of quicksilver at New York in 1930 was 6 per cent that of 1929. There was a 35 per cent decline in apparent consumption. Domestic production plus imports for consumption made available for consumers an indicated total of 25,200 flasks, after allowances for exports. This compared with 38,500 flasks in 1929.

With an output of 11,451 flasks, California was again the leading producing state in 1930 with 40 producers, compared

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Magnesium								
Magnesium Carb, tech, 70 lb bags NY...lb.	.06	.06½	.06	.06½	.06½	.06	.06½	.06
Chloride flake, 375 lb. drs c-l wks...ton	.....	36.00	.....	36.00	36.00	36.00	36.00	36.00
Imported shipment...ton	31.75	33.00	31.75	33.00	33.00	31.75	33.00	33.00
Fused, imp, 900 lb bbls NY ton	.....	31.00	.....	31.00	31.00	31.00	31.00	31.00
Fluosilicate, crys, 400 lb bbls wks...lb.	.10	.10½	.10	.10½	.10½	.10	.10½	.10
Oxide, USP, light, 100 lb bbls...lb.	.....	.42	.....	.42	.42	.42	.42	.42
Heavy, 250 lb bbls...lb.	.....	.50	.....	.50	.50	.50	.50	.50
Peroxide, 100 lb cs...lb.	1.00	1.25	1.00	1.25	1.25	1.00	1.25	1.00
Silicofluoride, bbls...lb.	.09¾	.10½	.09¾	.10½	.10½	.09¾	.10½	.09¾
Stearate, bbls...lb.	.24	.26	.24	.26	.26	.25	.26	.25
Manganese Borate, 30%, 200 lb bbls...lb.	.....	.19	.....	.19	.19	.19	.24	.19
Chloride, 600 lb casks...lb.	.07½	.08½	.07½	.08½	.08½	.07½	.08½	.08
Dioxide, tech (peroxide) drs lb.	.03½	.06	.03½	.06	.06	.03½	.06	.04½
Ore, Powdered or granular..								
75-80%, bbls...lb.	.02½	.03	.02½	.03	.03	.02½	.03½	.02½
80-85%, bbls...lb.	.....	.03½	.....	.03½	.03½	.03½	.04½	.03½
85-88%, bbls...lb.	.04	.04½	.04	.04½	.04½	.04	.05½	.04
Sulfate, 550 lb drs NY...lb.	.07	.08	.07	.08	.08	.07	.08½	.07
Mangrove 55%, 400 lb bbls...lb.	.....	.04	.03½	.04	Nom.	.03½	Nom.	.03½
Bark, African...ton	.....	27.00	25.50	29.75	33.00	29.75	35.00	30.00
Marble Flour, bulk...ton	14.00	15.00	14.00	15.00	15.00	14.00	15.00	14.00
Mercurous chloride...lb.	.....	1.27	1.27	2.05	2.05	2.05	2.05	2.05
Mercury metal...76 lb flask	89.00	90.00	89.00	106.00	124.50	106.00	126.00	120.00
Meta-nitro-aniline...lb.	.67	.69	.67	.69	.69	.67	.74	.67
Meta-nitro-para-toluidine 200 lb. bbls...lb.	1.40	1.55	1.40	1.55	1.55	1.50	1.55	1.50
Meta-phenylene-diamine 300 lb. bbls...lb.	.80	.84	.80	.84	.84	.80	.90	.80
Meta-toluene-diamine, 300 lb bbls...lb.	.67	.69	.67	.69	.69	.67	.72	.67
Methanol								
Methanol, (Wood Alcohol),....								
95%...gal.	.33	.35	.33	.37	.48	.35	.65	.51
97%...gal.	.34	.39	.34	.43	.49	.39	.65	.53
Pure, Synthetic drums cars gal.	.39½	.41½	.39½	.42½	.50	.42½	.68	.53
Synthetic tanks...gal.	.....	.35½	.35½	.40½	.50	.40½	.66	.54
Methyl Acetate, drums...gal.	.....	Nom.	.....	Nom.	Nom.	Nom.	.95	.95
Acetone,...gal.	.50	.55	50	.70	.77	.65	.85	.73
Anthraquinone,...lb.	.85	.95	.85	.95	.85	.70	.95	.85
Cellosolve, (See Ethylene Glycol Mono Methyl Ether)	.....	.....	.....	.....	.....	.....	.....	....
Chloride, 90 lb cyl...lb.	.45	.45	.45	.45	.45	.45	.60	.45
Furoate, tech., 50 gal. dr., .lb.	.....	.50	.....	.50	.50	.50	.50	.50
Mica, dry grd. bags wks...lb.	65.00	80.00	65.00	80.00	80.00	65.00	80.00	65.00
Wet, ground, bags wks...lb.	110.00	115.00	110.00	115.00	115.00	110.00	115.00	110.00
Michler's Ketone, kegs...lb.	.....	3.00	.....	3.00	3.00	3.00	3.00	3.00
Monochlorobenzene, drums see, Chorobenzene, mono...lb.								
Monomethylparaminosufate 100 lb drums...lb.	3.75	4.00	3.75	4.00	4.00	3.75	4.20	3.75
Montan Wax, crude, bags...lb.	.05½	.07	.05½	.07	.07	.06	.07	.06½
Myrobalans 25%, liq bbls...b	.03¾	.04½	.03¾	.04½	.04½	.03¾	.04½	.03¾
50% Solid, 50 lb boxes...lb.	.05	.05½	.05	.05½	.05½	.05	.08½	.05
J1 bags...ton	34.00	35.00	34.00	35.00	41.00	34.00	43.00	40.00
J 2 bags...ton	19.50	20.00	19.00	22.50	26.50	19.75	40.00	26.50
R 2 bags...ton	18.00	18.50	18.00	20.00	27.50	19.00	34.00	27.50
Naphtha, v. m. & p. (deodorized) bbls...gal.	.14	.16	.14	.18	.16	.16	.18	.16
Naphthalene balls, 250 lb bbls wks...lb.	.03¾	.04¾	.03¾	.04¾	.05½	.03¾	.05½	.05½
Crushed, chipped bgs wks..lb.	.....	.04	.....	.04	.04½	.04	.04½	.04½
Flakes, 175 lb bbls wks...lb.	.....	.03¾	.....	.03¾	.05	.03¾	.05	.05
Nickel Chloride, bbls kegs...lb.	.18	.20	.18	.21	.21	.20	.24	.20
Oxide, 100 lb kegs NY...lb.	.37	.40	.37	.40	.40	.37	.40	.37
Salt bbl. 400 bbls lb NY...lb.	.10½	.13	.10½	.13	.13	.10½	.13	.13
Single, 400 lb bbls NY...lb.	.10½	.12	.10½	.12	.13	.10½	.13	.13
Metal ingot...lb.	.35	.35	.35	.....	.....	.....	.....	.....
Nicotine, free 40%, 8 lb tins, cases...lb.	1.25	1.30	1.25	1.30	1.30	1.25	1.30	1.25
Sulfate, 10 lb tins...lb.	.98½	1.20	.98½	1.20	1.20	.98½	1.20	.98½
Nitre Cake, bulk...ton	12.00	14.00	12.00	14.00	18.00	12.00	18.00	12.00
Nitrobenzene, redistilled, 1000 lb drs wks...lb.	.09	.09½	.09	.09½	.09½	.09	.10½	.09
Nitrocellulose, c-l-l-cl, wks...lb.	.25	.36	.25	.36	.36	.25	.36	.25
Nitrogenous Material, bulk..unit	1.75	2.00	1.75	2.70	3.40	2.50	4.00	3.40
Nitronaphthalene, 550 lb bbls.lb.	.....	.25	.....	.25	.25	.25	.25	.25
Nitrotoluene, 1000 lb drs wks.lb.	.14	.15	.14	.15	.15	.14	.15	.14
Nutgalls Aleppy, bags...lb.	.16	.16½	.16	.16½	.16½	.16	.16½	.16
Chinese, bags...lb.	.12	.13	.12	.13	.13	.12	.13	.12
Oak Bark, ground...ton	30.00	35.00	30.00	35.00	35.00	30.00	50.00	30.00
Whole...ton	20.00	23.00	20.00	23.00	23.00	20.00	23.00	20.00
Orange-Mineral, 1100 lb casks NY...lb.	.11¾	.13	.11¾	.13	.13	.11¾	.13½	.11¾
Orthoaminophenol, 50 lb kgs..lb.	2.15	2.25	2.15	2.25	2.25	2.15	2.25	2.15
Orthoanisidine, 100 lb drs...lb.	2.50	2.60	2.50	2.60	2.60	2.50	2.60	2.50
Orthochlorophenol, drums...lb.	.50	.65	.50	.65	.65	.50	.65	.50
Orthocresol, drums...lb.	.25	.25	.25	.25	.35	.18	.28	.18
Orthodichlorobenzene, 1000 lb drums...lb.	.07	.10	.07	.10	.10	.07	.10	.07
Orthonitrochlorobenzene, 1200 lb drs wks...lb.	.30	.33	.30	.33	.33	.30	.33	.30
Orthonitrotoluene, 1000 lb drs wk...lb.	.16	.18	.16	.18	.18	.16	.18	.16
Orthonitrophenol, 350 lb dr...lb.	.85	.90	.85	.90	.90	.85	.90	.85
Orthotoluidine, 350 lb bbl lc-l lb.	.28	30	.25	.30	.30	.25	.30	.25

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - July 1931 $1.43

with a production of 10,139 flasks by 29 operators in 1929. Nevada was second with 3,282 flasks compared with 4,764 flasks in 1929, or 31 per cent less. Oregon ranked third with an output of 2,919 flasks, against 3,657 in 1929. Texas, Arizona and Alaska combined produced 2,822 flasks, against 3,725 in 1929.

Imports in 1930 totaled 2,943 flasks, valued at $295,829 as compared with 14,292 flasks, valued at $1,447,142 in 1929. Of the 1930 imports, 2,802 flasks were reported as received from Spain and 141 from Mexico.

Mercury Bichloride — A further reduction this past month brought the price down to $1.21 a lb., the result in the break in mercury prices.

Myrobalans — After a slight increase the price of R 2 grade was reduced to $18.00 a ton.

Nitrogenous Material — First hands were freely offering material in the last week of the month at $1.80 a unit.

Oxalates — The double salts, iron and ammonium, and iron and soda were forced to lower levels on July 13, both now being quoted at 27½c. The competitive position of domestic material with the imported has become more pronounced in the past month or two.

Paratoluidine — Weakness in raw materials brought about a reduction of 1c a lb. The new price is 42c.

Resorcin — Technical material was reduced ¼c a lb. on July 23, by leading producers. The competitive position of this product appeared to be growing more acute. The present market is 65c a lb.

Rosin — The chaotic condition prevailing in the primary markets for the past six weeks appeared to be eased somewhat when the Farm Board decided to reverse its earlier decision and prepared to advance additional funds in addition to the round total of $2,000,000 already advanced. With prices at the lowest point in years and with the marketing of independent material now in the hands chiefly of one large and powerful co-operative group, leading authorities were urging the wisdom of covering requirements at least for the balance of the current year. The latest statistics on the naval stores situation in the South reveal that the port stocks of turpentine on July 1 amounted to 104,048 barrels. This compared with 45,697 on the same date last year. Average stocks on July 1 for the past four years were about 54,500 barrels. It was evident that the lack of demand for gum spirits was the chief reason for the heavy stock situa-

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Orthonitroparachlorphenol, tins ....lb.	.70	.75	.70	.75	.75	.70	.75	.70
Osage Orange, crystals.......lb.	.16	.17	.16	.17	.17	.16	.17	.16
51 deg. liquid ....lb.	.07	.07½	.07	.07½	.07½	.07	.07½	.07
Powdered, 100 lb bags.....lb.	.14½	.15	.14½	.15	.15	.14½	.15	.14½
Paraffin, refd, 200 lb cs slabs								
123-127 deg. M P.........lb.	.....	.03	.03¼	.03	.04⅜	.03½	.06½	.04½
128-132 deg. M. P.........lb.	.....	.03½	.03¼	.03¼	.06⅝	.03½	.07	.04⅝
133-137 deg. M. P. ....lb	.....	.04¾	.04⅝	.04¾	.07¼	.04⅝	.07¼	.06½
Para Aldehyde, 110-55 gal drs..lb.	.20½	.23	.20½	.23	.23	.20½	.28	.20½
Aminoacetanilid, 100 lb bg..lb	.52	.60	.52	.60	1.05	.52	1.05	1.00
Aminohydrochloride, 100 lb kegs..................lb	1.25	1.30	1.25	1.30	1.30	1.25	1.30	1.25
Aminophenol, 100 lb keg...lb.	.82	.84	.82	.86	1.02	.92	1.15	.99
Chlorophenol, drums......lb.	.50	.65	.50	.65	.65	.50	.65	.50
Coumarone, 330 lb drums. lb.	.....	.....	.....	.....	.....	.....	.....	.....
Cymene, refd, 110 gal dr..gal.	2.25	2.50	2.25	2.50	2.50	2.25	2.50	2.25
Dichlorobenzene, 150 lb bbls wks..................lb.	.15½	.16	.15½	.20	.20	.17	.20	.17
Nitroacetanilid, 300 lb bbls.lb.	.50	55	.50	.55	.55	.50	.55	.50
Nitroaniline, 300 lb bbls wks ....lb.	.48	.55	.48	.55	.55	.48	.55	.48
Nitrochlorobenzene, 1200 lb drs wks..................lb.	.23	26	.23	.26	.26	.23	.26	23
Nitro-orthotoluidine, 300 lb bbls..................lb.	2.75	2.85	2.75	2.85	2.85	2.75	2.85	2.75
Nitrophenol 185 lb bbls....lb.	.45	50	.45	.50	.50	.45	.55	.45
Nitrosodimethylaniline, 120 lb. bbls..................lb.	.92	.94	.92	.94	.94	.92	.94	.92
Nitrotoluene, 350 lb bbls....lb.	.29	.31	.29	.31	.31	.29	.31	.29
Phenylenediamine, 350 lb bbls ....lb.	1.15	1.20	1.15	1.20	1.20	1.15	1.20	1.15
Tolueneulfonamide, 175 lb bbls..................lb.	.70	.75	.70	.75	75	.70	.75	.70
Toluenesulfonchloride, 410 lb bbls wks..............lb.	.20	.22	.20	.22	.22	.20	.22	.20
Toluidine, 350 lb bbls wk...lb.	.42	43	.40	.44	.40	.38	.42	.38
Paris Green, Arsenic Basis								
100 lb kegs...............lb.	.....	.27	.....	.27	.27	.27	.27	25
250 lb kegs...............lb.	.....	.26	.25	.26	.25	.25	.25	.23
Persian Berry Ext., bbls.....lb.	.25	Nom.	.25	Nom.	Nom.	.25	25	.25
Pentasol (see Alcohol, Amyl)...								
Pentasol Acetate (see Amyl Acetate)								
Petrolatum, Green, 300 lb bbl.lb.	.02	.02⅛	.02	.02⅛	.02⅛	.02	02⅛	.02
Phenol, 250-100 lb drums.....lb.	.14¾	.15	.14¾	.15	.15	.14¾	.16	13
Phenyl - Alpha - Naphthylamine, 100 lb kegs.............lb.	.....	1.35	.....	1.35	1.35	1.35	1.35	1.35
Phenylhydrazine Hydrochloride ....lb.	2.90	3.00	2.90	3.00	3.00	2.90		
Phosphate								
Phosphate Acid (see Superphosphate)								
Phosphate Rock, f.o.b. mines								
Florida Pebble, 68% basis..ton	3.10	3.25	3.10	3.25	3.15	3.00	3.15	3.00
70% basis.............ton	3.75	3.90	3.75	3.90	4.00	3.75	4.00	3.50
72% basis.............ton	4.25	4.35	4.25	4.35	4.50	4.25	4.50	4.00
75-74% basis..........ton	5.25	5.50	5.25	5.50	5.50	5.25	5.50	5.00
75% basis.............ton	.....	5.75	.....	5.75	5.75	5.75	5.75	5.75
77-80% basis..........ton	.....	6.25	.....	6.25	6.25	6.25	6.25	6.25
Tennessee, 72% basis.....ton	.....	5.00	.....	5.00	5.00	5.00	5.00	5.00
Phosphorous Oxychloride 175 lb cyl....................lb.	.18	.20	.18	.20	.25	.18	.40	.20
Red, 110 lb cases........lb.	.37½	.42	.37½	.42	.42	.37½	.60	.37½
Yellow, 110 lb cases wks..lb.	.31	.37½	.31	.37½	.37½	.31	.32	.31
Sesquisulfide, 100 lb cs.....lb.	.....	.44	.....	.44	.44	.44	.46	.44
Trichloride, cylinders......lb.	.18	.20	.18	.20	.25	.18	.35	.20
Phthalic Anhydride, 100 lb bbls wks..................lb.	.15	.16	.15	.16	.20	.15	.20	.18
Pigments Metallic, Red or brown bags, bbls, Pa. wks.... ton	37 00	45.00	37.00	45.00	45.00	37.00	45.00	37.00
Pine Oil, 55 gal drums or bbls								
Destructive dist...........lb.	.63	.64	.63	.64	.64	.63	64	.63
Prime bbls..............bbl.	8.00	10.60	8.00	10.60	10.60	8.00	10 60	8 00
Steam dist. bbls..........gal.	.54	.61	.54	.70	.70	65	70	.65
Pitch Hardwood,, wks..................ton	35.00	45.00	35.00	45.00	45.00	35.00	45.00	40 00
Plaster Paris, tech, 250 lb bbls ....bbl.	3:30	3.50	3.30	3.50	3.50	3 30	3.50	3.30
Platinum, Refined..........oz.	27.00	28 00	27.00	28.00	....	.....	.....	.....
Potash								
Potash, Caustic, wks, solid...lb.	06⅛	.06⅜	.06⅛	.06⅜	.06⅜	06⅛	.07⅛	06⅛
flake ....lb.	.0705	08	.0705	.08	.08	.0705	.07½	.0705
Potash Salts, Rough Kainit								
12.4% basis bulk.......ton	.....	9.20	.....	9.20	9 20	9 10	9.10	9 00
14% basis.............ton	.....	9.70	.....	9.70	9 70	9.60	9.60	9.50
Manure Salts................								
20% basis bulk.........ton	.....	12.65	.....	12 65	12.65	12 50	12 50	12 40
30% basis bulk.........ton	....	19.15	.....	19.15	19 15	18 95	18 95	18.75
Potassium Acetate..........lb.	.28	.30	.28	.30	.30	.27		
Potassium Muriate, 80% basis bags..................ton	.....	37.15	.....	37.15	37.15	36 75	36.75	36.40
Pot. & Mag. Sulfate, 48% basis bags..................ton	.....	27.80	.....	27.80	27.80	27 50	27 50	27 00
Potassium Sulfate, 90% basis bags..................ton	.....	48.25	.....	48.25	48.25	47.75	47.75	47.30
Potassium Bicarbonate, USP, 320 lb bbls................lb.	.09½	.10	.09½	.10	.10	.09½	.14	.09½
Bichromate Crystals, 725 lb casks................lb.	.08¾	.09½	.08¾	.09½	.09¼	.08¾	.09¼	.09
Powd., 725 lb cks wks....lb.	.13	.13¼	.13	.13¼	.13¼	.13	.13¼	.13

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - July 1931 $1.43

tion since receipts for the period April 1-July 1 were 119,946 barrels, against 127,386 for the period last year. Average receipts over a four-year stretch were about 125,000 barrels. Rosin stocks on July 1 amounted to 442,501 barrels. This compared with 202,685 a year ago and an average of 165,000. Receipts of rosins for the period April 1-July 1 equaled 389,969, as compared with 398,747 last year. The average over a four-year period was 392,000 barrels. For further anzlysis of the naval store industry see, "Wanted-New Uses, page 142.

Salt Cake — The competitive position of salt cake became still further acute as the paper and glass industries failed to show any signs of revival. Stocks continue to increase and the future outlook for this commodity is quite bearish.

Sal Soda — Seasonal increase was noted with prices steady.

Shellac — Prices moved within very narrow limits in very light trading. Standard Statistics, in a comprehensive survey of the commodity markets, reports the advisability of gradually increasing supplies for forward requirements.

Soda Ash — Producers were moving very small tonnages with operations in the glass, paper and petroleum fields seriously curtailed. Interest is beginning to center on the approaching contract season and while it is still several months away consumers are speculating on the present stocks of alkalies. A great deal is thought to depend on whether manufacturers have reduced production schedules to the point where tonnages balance the restricted demands from most consuming channels.

Caustic Soda — The market was a very dull and routine affair during the past month with shipments curtailed to a minimum. This was not unexpected and producers were prepared to schedule production accordingly. Spot sales were being made at firm prices.

Sodium Bichromate — Shipments into most consuming channels reflected summer curtailment. Operations in the tanning and textile industries still continue at an encouraging rate. The price structure remains unchanged.

Sodium Nitrate — Markets for both the Chilean nitrate and the synthetic were marking time waiting further developments in the serious situation which has arisen as a result of the failure of the Lucerne conference. Prices are quoted unchanged, but these are merely nominal pending some decisive action. While not overly optimistic, those close to inside story seemed to feel that there was con-

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Binoxiate, 300 lb bbls......lb.	.14	.17	.14	.17	.17	.14	.17	.14
Bisulfate, 100 lb kegs......lb.	.....	.30	.....	.30	.30	.30	.30	.30
Carbonate, 80-85% calc. 800 lb casks..............lb.	.....	.05	.05	.05¾	.05¾	.05⅝	.05¾	.05⅝
Chlorate crystals, powder 112 lb keg wks...........lb.	.08	.08½	.08	.08½	.09	.08	.09	.08½
Chloride, crys bbls.........lb.	.05½	.06	.05½	.06	.06	.05½	.05½	.05½
Chromate, kegs...........lb.	.23	.28	.23	.28	.28	.23	.28	.23
Cyanide, 110 lb. cases.....lb.	.55	.57½	.55	.57½	.57½	.55	.57½	.55
Metabisulfite, 300 lb. bbl...lb.	.12	.13	.12	.13	.13	.12	.13	.11
Oxalate, bbls.............lb.	.20	.24	.20	.24	.24	.20	.24	.16
Perchlorate, casks wks.....lb.	.11	.12	.11	.12	.12	.11	.12	.11
Permanganate, USP, crys 500 & 100 lb drs wks........lb.	.16	.16½	.16	.16½	.16½	.16	.16½	.16
Prussiate, red, 112 lb keg...lb.	.38	.40	.38	.40	.40	.38	.40	.38
Yellow, 500 lb casks.....lb.	.18½	.21	.18½	.21	.21	.18½	.21	.18½
Tartrate Neut, 100 lb keg..lb.	.....	.21	.....	.21	.21	.21	.51	.51
Titanium Oxalate, 200 lb bbls ....lb.	.21	.23	.21	.23	.23	.21	.25	.21
Propyl Furoate, 1 lb tins.....lb.	.....	5.00	.....	5.00	5.00	5.00	5.00	5.00
Pumice Stone, lump bags.....lb.	.04	.05	.04	.05	.05	.04	.05	.04
250 lb bbls.............lb.	.04½	.06	.04½	.06	.06	.04½	.06	.04½
Powdered, 350 lb bags.....lb.	.02½	.03	.02½	.03	.03	02½	.03	.02½
Putty, commercial, tubs..100 lb.	.....	.03½	.....	.03½	.03½	.03½	.03½	.03½
Linseed Oil, kegs......100 lb.	.....	.05½	.....	.05½	.05½	.05½	.05½	.05½
Pyridine, 50 gal drums......gal.	1.50	1.75	1.50	1.75	1.75	1.50	1.75	1.50
Pyrites, Spanish cif Atlantic ports bulk.............unit	.13	.13¾	.13	.13¾	.13¾	.13	.13¾	.13
Quebracho, 35% liquid tks....lb.	.02¾	.04	.02¾	.04	.04	.02¾	.04	.03
450 lb bbls c-1..........lb.	.03½	.03¾	.03½	.03¾	.03¾	.03½	.04½	.03½
35% Bleaching, 450 lb bbl .lb.	.04½	.05¼	.04½	.05¼	.04½	.05¼	.04½	.05¼
Solid, 63%, 100 lb bales cif..lb.	.05	.05½	.05	.05½	.05½	.05	.05¾	.05½
Clarified, 64%, bales.....lb.	.....	.05⅝	.....	.05⅝	.05⅝	.05⅝	.05⅝	.05⅝
Quercitron, 51 deg liquid 450 lb bbls.................lb.	.05½	.06	.05½	.06	.06	.05½	.06	.05½
Solid, 100 lb boxes.........lb.	.09½	.13	.09½	.13	.13	.09½	.13	.10
Bark, Rough...........ton	.....	14.00	.....	14.00	14.00	14.00	14.00	14.00
Ground................ton	34.00	35.00	34.00	35.00	35.00	34.00	35.00	34.00
R Salt, 250 lb bbls wks......lb.	.40	.44	.40	.44	.45	.40	.46	.44
Red Sanders Wood, grd bbls..lb.	.....	.18	.....	.18	.18	.18	.18	.18
Resorcinol Tech, cans........lb.	.65	.70	.65	1.25	1.25	.90	1.25	1.15
Rosin Oil, 50 gal bbls, first run ....gal.	.....	.50	.50	.58	.58	.56	.62	.57
Second run............gal.	.....	.54	.54	.61	.61	.59	.64	.60

Rosin

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Rosins 600 lb bbls 280 lb...unit ex. yard N. Y.								
B......................	.....	4.20	4.15	4.95	7.75	5.35	9.25	7.45
D......................	.....	4.25	4.25	5.50	8.00	5.50	9.25	7.70
E......................	.....	4.30	4.30	5.90	8.17	5.52½	9.27	8.30
F......................	.....	4.35	4.35	6.20	8.45	5.55	9.27	8.40
G......................	.....	4.40	4.40	6.25	8.45	5.60	9.45	8.40
H......................	.....	4.45	4.45	6.30	8.55	5.60	9.50	8.40
I......................	.....	4.50	4.50	6.35	8.58	5.62½	9.50	8.40
K......................	.....	4.55	4.55	6.45	8.65	5.62½	9.55	8.45
M......................	.....	4.60	4.60	6.70	8.80	5.65	9.85	8.50
N......................	.....	5.00	5.00	6.95	8.95	6.05	10.30	8.93
WG.....................	.....	6.50	6.50	8.15	9.25	6.85	11.30	9.00
WW.....................	.....	6.90	6.90	8.90	9.85	7.85	12.30	9.30
Rotten Stone, bags mines....ton	24.00	20.00	24.00	20.00	30.00	18.00	30.00	24.00
Lump, imported, bbls......lb.	.05	.07	.05	.07	.07	.05	.08	.05
Selected bbls............lb.	.09	.12	.09	.12	.12	.09	.12	.09
Powdered, bbls...........lb.	.02	.05	.02	.05	.05	.02	.05	.02
Sago Flour, 150 lb bags......lb.	.04½	.05	.04½	.05	.05	.04½	.05	.04½
Sal Soda, bbls wks.......100 lb.	.....	1.00	.....	1.00	1.00	1.00	1.00	1.00
Salt Cake, 94-96% c-1 wks. .ton	15.00	15.50	15.50	19.00	24.00	15.50	24.00	19.00
Chrome ....ton	14.00	14.50	14.00	17.00	25.00	14.50	21.00	12.00
Saltpetre, double refd granular 450-500 lb bbls..........lb.	.06	.06¾	.06	.06¾	.06¾	.06½	.06½	.06½
Satin, White, 500 lb bbls.....lb	.....	.01½	.....	.01½	.01½	.01½	.01½	.01½
Shellac Bone dry bbls........lb.	.28	.30	.28	.29	.47	.28	.61	.47
Garnet, bags..............lb.	.19	.20	.19	.26	.40	.24	.45	.40
Superfine, bags...........lb.	.....	.17½	.17½	.22	.39	.20	.47	.39
T. N. bags...............lb.	.16	.16½	.16	.17	.34	.18	.44	.36
Schaeffer's Salt, kegs.........lb.	.53	.57	.53	.57	.57	.53	.57	.53
Silica, Crude, bulk mines....ton	8.00	11.00	8.00	11.00	11.00	8.00	11.00	8.00
Refined, floated bags......ton	22.00	30.00	22.00	30.00	30.00	22.00	30.00	22.00
Air floated bags.........ton	.....	32.00	.....	32.00	32.00	32.00	32.00	32.00
Extra floated bags......ton	32.00	40.00	32.00	40.00	40.00	32.00	40.00	32.00
Soapstone, Powdered, bags f. o. b. mines.................ton	15.00	22.00	15.00	22.00	22.00	15.00	22.00	15.00

Soda

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Soda Ash, 58% dense, bags c-1 wks................100 lb.	.....	1.17½	.....	1.17½	1.40	1.40	1.40	1.40
58% light, bags.......100 lb.	.....	1.15	.....	1.15	1.34½	1.34½	1.34½	1.34½
Contract, bags c-1 wks. 100 lb.	.....	1.15	1.15	1.15	1.32	1.32	1.32	1.32
Soda Caustic, 76% grnd & flake drums..............100 lb.	.....	2.90	.....	2.90	3.35	3.00	3.35	3.35
76% solid drs.........100 lb.	.....	2.50	.....	2.50	2.95	2.90	2.95	2.95
Sodium Acetate, tech....450 lb. bbls wks...............lb.	.....	.05	.04½	.05	.05½	.04	.06½	.04½
Arsenate, drums..........lb.	.18	.19	.18	.19	.19	.18	.19	.18
Arsenite, drums..........gal.	.50	.75	.50	.75	1.00	.50	1.50	.75
Bicarb, 400 lb bbl NY..100 lb.	.....	2.35	2.35	2.35	2.41	2.41	2.41	2.41

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - July 1931 $1.43

siderable reason to believe that the foreign synthetic producers would reach an agreement and that further negotiations with the representatives of the "Cosach" would bring about some sort of a truce. See news section, page 177.

Sodium Silicate — Quiet prevailed in the market for both the cloudy and water white grades. Considerable let-up in the textile dyeing centers has brought about a reduction in tonnages but prices are firm and unchanged. Movement into the soap industry was better in June than for any previous month during the present year.

Sodium Stannate — Fresh weakness at the close of the month in the metal brought about a reduction of ½c, bringing the price of the salt down to the early June figure.

Sulfur — Continued curtailment in acid production is reflected in the earnings of the sulfur companies, the second quarter for Texas Gulf being below the first quarter. Despite the reduction in tonnage, it is extremely unlikely that there will be any revision of prices.

Superphosphate — Producers have effected a very stringent curtailment of manufacturing activity but stocks on hand still reflect the bad position the farmer is in. It is quite evident that production will be held at a minimum during the coming year in an effort to move the accumulation. A reduction of ½c was made as the month closed.

Tankage — Partly due to the unsettled condition at the moment in the nitrogen situation and partly to an effort to move accumulating stocks, tankage moved to new low prices when $1.75, per unit was named for ground and $1.60 for unground.

Tin — The metal was off at ½c from the close in June. Actual sales were small by comparison with other months. The adherence of Siam into the European Cartel has strengthened the belief in this country that it is advisable to utilize any further recessions in price to accumulate stocks ahead.

Tin Crystals — Producers announced, Aug. 1, a reduction of ½c, the new price being 24½c a lb.

Tin Tetrachloride — The new schedule announced, Aug. 1, was based on 17.4c a lb.

Toluol — Pure material was reduced 1c a gal. on July 23, the new price being based on 27c. The coal group of chemicals has withstood in a remarkable way the general lowering of prices and some readjustment of schedules was looked for. The future trend of the market is dependent mainly on the future situation in the steel industry. At the moment furnaces in blast are

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Bichromate, 500 lb cks wks.lb.	.07	.07½	.07	.07½	.07½	.07	.07¾	.07
Bisulfite, 500 lb bbl wks....lb.	.....	.04	.....	.04	.04	.04	.04	.04
Carb. 400 ib bbls NY..100 lb.	.....	2.30	.....	2.30	2.30	2.30	1.35	1.30
Chlorate, ... wks..lb.	.05¾	.07¾	.05¾	.07¾	.08	.05¾	.11	.06½
Chloride, technical........ton	12.00	13.00	12.00	13.00	13.00	12.00	13.00	12.00
Cyanide, 96-98%, 100 & 250 lb drums wks...........lb.	.16	.17	.16	.17	.20	.16	.20	.18
Fluoride, 300 lb bbls wks...lb.	.07½	.08½	.07½	.08½	.09	.08½	.09	.08½
Hydrosulfite, 200 lb bbls f. o. b. wks.................lb.	.22	.24	.22	.24	.24	.22	.24	.22
Hypochloride solution, 100 lb cbys.................lb.	.....	.05	.....	.05	.05	.05	.05	.05
Hyposulfite, tech, pea cyrs 375 lb bbls wks......100 lb.	2.40	3.00	2.40	3.00	3.00	2.40	3.05	2.50
Technical, regular crystals 375 lb bbls wks....100 lb.	2.50	2.65	2.50	2.65	2.65	2.50	2.65	2.40
Metanilate, 150 lb bbls.... lb.	.44	.45	.44	.45	.45	.44	.45	.45
Monohydrate, bbls........lb.	.....	.02½	.....	.02½	.02½	.02½	.02½	.02½
Naphthionate, 300 lb bbl...lb.	.5	.54	.52	.54	.57	.52	.57	.54
Nitrate, 92%, crude, 200 lb bags c-1 NY......100 lb.	.....	2.05	2.02	2.07	2.22½	1.99	2.22½	2.09
Nitrite, 500 lb bbls spot....lb.	.07	.08	.07½	.08	.08	.07½	.08	.07½
Orthochlorotoluene, sulfonate, 175 lb bbls wks.......lb.	.25	.27	.25	.27	.27	.25	.27	.25
Oxalate Neut, 100 lb kegs..lb.	.37	.42	.37	.42	.42	.37	.42	.37
Perborate, 275 lb bbls.....lb.	.18	.20	.18	.20	.20	.18	.22	.18
Phosphate, di-sodium, tech. 310 lb bbls.......100 lb.	2.50	3.00	2.50	3.00	3.25	2.65	3.55	3.25
tri-sodium, tech, 325 lb bbls...............100 lb.	.....	3.20	3.15	3.50	4.00	3.25	4.00	3.90
Picramate, 100 lb kegs.....lb.	.69	.72	.69	.72	.72	.69	.72	.69
Prussiate, Yellow, 350 lb bbl wks.................lb.	.11½	.12	.11½	.12	12½	.11½	.12½	.12
Pyrophosphate, 100 lb keg..lb.	.15	.20	.15	.20	.20	.15	.20	.15
Silicate, 60 deg 55 gal drs, wks ....100 lb.	.....	1. 5	.....	1.65	1.65	1.65	1.35	1.65
40 deg 55 gal drs, wks ....100 lb.	.75	1.00	.75	1.00	.80	.70	.80	.70
Silicofluoride, 450 lb bbls NY ....lb.	....	.04½	.04	.04¾	.05½	.04	.05½	.05
Stannate, 100 lb drums....lb.	.19½	.20½	.19½	.26	.43	.24	.43	.38
Stearate, bbls............lb.	.20	.25	.20	.25	.29	.20	.29	.25
Sulfanilate, 400 lb bbls.....lb.	.16	.18	.16	.18	.18	.16	.18	.16
Sulfate Anhyd, 550 lb bbls c-1 wks..............lb.	.02½	.02¾	.02½	.02¾	.02¾	.02½	.02¾	.02½
Sulfide, 80% crystals, 440 lb bbls wks.............lb.	.02½	.02¾	.02½	.02¾	.02¾	.02½	.02¾	.02½
62% solid, 650 lb drums lc-1 wks.............lb	.03	03½	.03	.03½	.03½	.03	.04	.03½
Sulfite, crystals, 400 lb bbls wks.................lb.	.03	.03½	.03	.03½	.03½	.03	.03½	.03
Sulfocyanide, bbls.........lb.	.28	.35	.28	.35	.35	.28	.76	.28½
Tungstate, tech, crystals, kegs ....lb.	.81	.88	.81	.88	.88	.81	1.40	.88
Solvent Naphtha, 110 gal drs wks................gal.	.30	.38	.30	.38	.40	.30	.40	.35
Spruce, 25% liquid, bbls.....lb.	.....	.01⅜	.....	.01⅜	.01⅜	.01⅜	.01⅜	.01⅜
25% liquid, tanks wks.....lb.	.....	.01	.....	.01	.01	.01	.01	.01
50% powd, 100 lb bag wks lb.	.02	.02½	.02	.02½	.02½	.02	.02½	.02
Starch, powd., 140 lb bags ....100 lb.	.....	2.57	2.57	3.20	4.02	3.42	4.12	3.82
Pearl, 140 lb bags.....100 lb.	.....	2.77	2.77	3.00	3.92	3.32	4.02	3.72
Potato, 200 lb bags........lb.	.05½	.06	.05½	.06	.06½	.05½	.06¾	.05¾
Imported bags..........lb.	.05¾	.06½	.05¾	.06½	.06½	.05¾	.06¾	.05¾
Soluble................lb.	.08	.08½	.08	.08½	.08½	.08	.08½	08
Rice, 200 lb bbls..........lb.	.09	.10	.09	.10	.10	.09	.10	.09½
Wheat, thick bags........lb.	.06½	.07	.06½	.07	.07	.06½	.07	.06½
Thin bags..............lb.	.09½	.10	.09½	.10	.10	.09½	.10	.09½
Strontium carbonate, 600 lb bbls wks...................lb.	.07½	.07½	.07½	.07½	.07½	.07½	.07½	.07½
Nitrate 600 lb bbls NY....lb.	.09	.09½	.09	.09½	.09½	.09	.09½	.08¾
Peroxide, 100 lb drs.......lb.	.....	1.25	.....	1.25	1.25	1.25	1.25	1.25

Sulfur

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Sulfur Brimstone, broken rock, 250 lb bag c-1.......100 lb.	.....	2.05	.....	2.05	2.05	2.05	2.05	2.05
Crude, f. o. b. mines......ton	18.00	19.00	18.00	19.00	19.00	18.00	19.00	18.00
Flour for dusting 99½%, 100 lb bags c-1 NY....100 lb.	.....	2.40	.....	2.40	2.40	2.40	2.40	2.40
Heavy bags c-1......100 lb.	.....	2.50	.....	2.50	2.50	2.50	2.50	2.50
Flowers, 100%, 155 lb bbls c-1 NY.............100 lb.	.....	3.45	.....	3.45	3.45	3.45	3.45	3.45
Roll, bbls 1c-1 NY.....100 lb.	2.65	2.85	2.65	2.85	2.85	2.65	2.85	2.65
Sulfur Chloride, red, 700 lb drs wks...................lb.	.05	.05½	.05	.05½	.05½	.05	.05½	.05
Yellow, 700 lb drs wks.....lb.	.03½	.04½	.03½	.04½	.04½	.03½	.04½	.03½
Sulfur Dioxide, 150 lb cyl....lb.	.07	.07½	.07	.07½	.07½	.07	.08½	.07
Extra, dry, 100 lb cyl......lb.	.10	.12	.10	.12	.12	.10	.19	.10
Sulfuryl Chloride,..........lb.	.15	.40	.15	.40	.65	.10	.65	.10
Talc, Crude, 100 lb bgs NY...ton	12.00	15.00	12.00	15.00	15.00	12.00	15.00	12.00
Refined, 100 lb bgs NY..ton	16.00	18.00	16.00	18.00	18.00	16.00	18.00	16.00
French, 220 lb bags NY...ton	18.00	22.00	18.00	22.00	22.00	18.00	25.00	18.00
Refined, white, bags....ton	35.00	40.00	35.00	40.00	40.00	35.00	45.00	35.00
Italian, 220 lb bags NY...ton	40.00	50.00	40.00	50.00	50.00	40.00	50.00	40.00
Refined, white, bags....ton	50.00	55.00	50.00	55.00	55.00	50.00	55.00	50.00
Superphosphate, 16% bulk, wks...................ton	.....	7.25	7.25	9.00	9.50	8.00	10.00	9 00
Triple bulk, wks.........unit	.....	.65	.....	.65	.65	.65	.....	.....
Tankage Ground NY.......unit	.....	1.75&10	1.75	3.20&10	4.00&10	3.20&10	4.50&10	4.00&10
High grade f.o.b. Chicago.unit	.....	1.50&10	1.50	3.25&10	3.85&10	3.25&10	4.80&10	3 75&10
South American cif.......unit	.....	2.45&10	2.45	3.40&10	4.25&10	3.40&10	4 80&10	4.35&10
Tapioca Flour, high grade bgs.lb.	.03½	.05	.03½	.05	.05¾	.03	.05¾	.04¾
Medium grade, bags.....lb.	.03	.04	.03	.04	.04¾	.02½	.04¾	.03¾
Tar Acid Oil, 15%,drums....gal.	.24	.25	.24	.25	.27	.24	.27	.26
25% drums.............gal.	.26	.28	.26	.28	.30	.26	.30	.29

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - July 1931 $1.43

reported to be only 30% of capacity, the lowest figure that has prevailed for many years, to be exact, 1916. Indications point to a partial pick-up in September.

Trisodium Phosphate — After months of extreme weakness the market in this commodity finally showed signs of firmness as leading producers announced an upward revision in spot prices, the new carlot figure being based at $3.20 a cwt. Most consumers contracted at the lower price for the balance of the year, but the move stabilized a market that has been in a chaotic condition for a long time. There is little likelihood of any further change until the opening of the fall contract season.

Turpentine — The market for turpentine closed weak with dealers freely offering steam distilled in five barrel lots at 40c a gallon. The carlot price, ex dock was given as 36¼c. Actual demand was very spotty. Leading factors however were pointing to the extremely low prices and advising some accumulation of stocks.

Xylol — Commercial grade was reduced to 24c on July 23.

Zinc — The metal moved within very narrow limits and quotations were off only 5c for the month. Actual inquiries were very light and consumers aseemed to be holding to a policy of restricting purchases to immediate needs, with-holding from any forward committments expecting further price recessions. Some doubt existed as to this possibility however when June production figures showed a drop for June and cable from abroad pointed to further restrictive measures on production. World output of slab zinc amounted to 82,063 short tons in June against 86,393 tons in May and 89,637 tons in April, according to American Bureau of Metal Statistics. Following table gives in short tons production of leading countries unallocated as to country of origin except in case of United States and Mexico, and world production for first six months of 1931. Zinc produced in United States from Mexican ore is credited to Mexico.

	May	*June*	*Jan.-June*
United States	25,688	23,483	172,720
Mexico	3,630	3,184	20,666
Canada	12,049	11,226	66,513
Belgium	(d)	(d)	79,512
France	6,004	5,786	38,001
Germany	3,354	3,015	27,332
Great Britain	1,924	1,282	13,593
Italy	1,409	1,436	9,531
Netherlands	2,000	2,000	11,811
Poland	13,887	13,417	89,601
Spain	972	936	5,674
Australia	5,339	6,250	31,514
Rhodesia	1,137	1,148	7,696
Elsewhere	9,000	8,900	52,700

Zinc Sulfate — While consumption in the paint trade has fallen off considerably from 1930 producers have managed to hold prices in a fairly stable condition.

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Terra Alba Amer. No. 1, bgs or bbls mills.........100lb.	1.15	1.75	1.15	1.75	1.75	1.15	1.75	1.15
No. 2 bags or bbls...100lb.	1.50	2.00	1.50	2.00	2.00	1.50	2.00	1.50½
Imported bags............lb.	.01¼	.01½	.01¼	.01½	.01½	.01¼	.02½	.01
Tetrachlorethane, 50 gal dr...lb.	.09	.09½	.09	.09½	.09½	.09	.09½	.09
Tetralene, 50 gal drs wks.....lb.	.....	.20	.....	.20	.20	.20	.20	.20
Thiocarbanilid, 170 lb bbl....lb.	.26½	.28½	.26½	.28½	.28½	.22	.24	.22
Tin Bichloride, 50% soln, 100 lb bbls wks..............lb.	.....	.12¾	.....	.12¾	.12¾	.12¾	.14¾	.13½
Crystals, 500 lb bbls wks...lb.	.24½	.25	.24	.28½	.34	.25	.38	.33
Metal Straits NY.........lb.	.....	.24½	.22½	.27	.38	.26	.48	.39
Oxide, 300 lb bbls wks.....lb.	.25	.29	.25	.29	.42	.25	.56	.42
Tetrachloride, 100 lb drs wks ....lb.	.1740	.1785	.17¼	.19½	.20½	.18¼	.30½	.27¼
Titanium Dioxide 300 lb bbl..lb	.21	.22	.21	.22	.50	.21	.50	.22
Pigment, bbls............lb.	.06½	.07¾	.06½	.07¾	.07¾	.06½	.14	.07½
Toluene, 110 gal drs........gal.	.....	.34	.....	.34	.40	.35	.45	.45
8000 gal tank cars wks....gal.	.27	.28	.27	.30	.35	.30	.40	.40
Toluidine, 350 lb bbls........lb.	.88	.89	.88	.94	.94	.90	.94	.90
Mixed, 900 lb drs wks.....lb.	.27	.32	.27	.32	.32	.27	.32	.31
Toner Lithol, red, bbls.......lb.	.90	.95	.90	.95	.95	.90	.95	.85
Para, red, bbls............lb.	.....	.80	.....	.80	.80	.80	.80	.70
Toluidine ....lb.	1.50	1.55	1.50	1.55	1.55	1.50	1.55	1.50
Triacetin, 50 gal drs wks.....lb.	.32	.36	.32	.36	.36	.32	.36	.32
Trichlorethylene, 50 gal dr...lb.	.10	.10½	.10	.10½	.10½	.10	.10½	.10
Triethanolamine, 50 gal drs...lb.	.40	.42	.40	.42	.42	.40	.60	.55
Tricresyl Phosphate, drs.....lb.	.33	.45	.33	.45	.45	.33	.45	.33
Triphenyl guanidine.........lb.	.58	.60	.58	.60	.60	.58	.70	.58
Phosphate, drums..........lb.	.60	.70	.60	.70	.70	.60	.75	.60
Tripoli, 500 lb bbls......100 lb.	.75	2.00	.75	2.00	2.00	1.75	2.00	1.75
Tungsten, Wolframite,..per unit	11.25	11.75	11.25	11.75	.....	.....	.....	.....
Turpentine carlots, bbls.....gal.	.....	.36½	.36½	.57	.61¾	.41	.65	.51½
Wood Steam dist. bbls....gal.	.....	.40	.40	.61	.52	.36	.57	.49
Urea, pure, 112 lb cases......lb	.15	.17	.15	.17	.17	.15	.30	.15
Fert. grade, bags c.i.f.....ton	....	108.00	.....	108.00	108.00	108.00	105.00	98.00
c. i. f. S. points.........ton	.....	109.30	.....	109.30	109.30	109.30	106.30	99.30
Valonia Beard, 42%, tannin bags..................ton	.....	40.00	.....	40.00	40.00	39.50	55.00	42.00
Cups, 30-31% tannin.....ton	24.00	25.00	24.00	25.00	27.00	24.00	35.00	30.00
Mixture, bark, bags.......ton	30.00	31.00	30.00	31.00	32.50	30.00	43.00	35.00
Vermillion, English, kegs....lb..	1.75	1.80	1.75	1.80	2.05	1.75	2.05	2.00
Vinyl Chloride, 16 lb cyl.....lb.	.....	1.00	.....	1.00	1.00	1.00	1.00	1.00
Wattle Bark, bags..........ton	35.50	36.00	35.50	41.00	47.75	40.00	49.75	43.50
Extract 55%, double bags ex-dock...................lb.	.05⅞	.06½	.05⅞	.06½	.06½	.05⅞	.06½	.06½
Whiting, 200 lb bags, c-1 wks ....100 lb.	.....	1.00	.....	1.00	1.00	1.00	1.25	1.00
Alba, bags c-1 NY........ton	.....	13.00	.....	13.00	13.00	13.00	13.00	13.00
Gilders, bags c-1 NY...100 lb.	.....	1.35	.....	1.35	1.35	1.35	1.35	1.35
Xylene, 10 deg tanks wks. .gal.	.....	.28	.....	.28	.31	.28	.33	.33
Commercial, tanks wks...gal.	.24	.25	.24	.30	.33	.25	.32	.30
Xylidine, crude.............lb.	.36	.37	.36	.37	.38	.37	.38	.38

Zinc

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Zinc Ammonium Chloride powd., 400 lb bbls.........100 lb.	5.25	5.75	5.25	5.75	5.75	5.25	5.75	5.25
Carbonate Tech, bbls NY..lb.	.10½	.11	.10½	.11	.11	.10½	.11	.10½
Chloride Fused, 600 lb drs. wks..................lb.	.05¾	.06	.05¾	.06	.06	.05¾	.06	.05¾
Gran., 500 lb bbls wks.....lb.	.05¾	.06	.05¾	.06	.06½	.05¾	.06½	.06½
Soln 50%, tanks wks...100 lb.	2.25	3.00	2.25	3.00	3.00	2.25	3.00	3.00
Cyanide, 100 lb drums.....lb.	.38	.39	.38	.39	.41	.38	.41	.40
Dithiofuroate, 100 lb dr....lb.	.....	1.00	.....	1.00	1.00	1.00	1.00	1.00
Dust, 500 lb bbls c-1 wks...lb.	.0560	.0585	.0560	.07	.11	.06	.08½	.08½
Metal, high grade slabs c-1 NY...............100 lb.	4.20	4.25	3.60	4.45	6.45	4.10	6.45	6.45⅞
Oxide, American bags wks..lb.	.06½	.07	.06½	.07	.07⅜	.06½	.07⅜	.07
French, 300 lb bbls wks...lb.	.09⅜	.11⅜	.09⅜	.11⅜	.11⅜	.09⅜	.11⅜	.09⅜
Perborate, 100 lb drs......lb.	.....	1.25	.....	1.25	1.25	1.25	1.25	1.25
Peroxide, 100 lb drs.......lb.	.....	1.25	.....	1.25	1.25	1.25	1.25	1.25
Stearate, 50 lb bbls........lb.	.19	.22	.19	.23	.26	.20	.26	.25
Sulfate, 400 bbl wks.......lb.	.03	.03½	.03	.03½	.03½	.03	.03¾	.03
Sulfide, 500 lb bbls........lb.	.16	.16½	.16	.16½	.32	.16	.32	.30
Sulfocarbolate, 100 lb keg..lb.	.28	.30	.28	.30	.30	.28	.30	.28
Zirconium Oxide, Nat. kegs...lb.	.02½	.03	.02½	.03	.03	.02½	.03	.02½
Pure kegs.................lb.	.45	.50	.45	.50	.50	.45	.50	.45
Semi-refined kegs..........lb.	.08	.10	.08	.10	.10	.08	.10	.08

Oils and Fats

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Castor, No. 1, 400 lb bbls.....lb.	.11	.11½	.11	.12	.13½	.11½	.13½	.13
No. 3, 400 lb bbls.........lb.	.10¼	.11	.10½	.11¾	.13	.11	.13	.12½
Blown, 400 lb bbls.........lb.	.13¾	.14	.13¾	.14	.15	.12	.15	.14
China Wood, bbls spot NY...lb.	.07⅜	.07½	.07	.07½	.13	.07	.16	.14½
Tanks, spot NY.........lb.	.06⅜	.06½	.06	.07	.11⅜	.06	.15	.13½
Coast, tanks, ...lb.	.06	.06½	.05½	.06½	.10⅞	.05½	.14½	.12½
Cocoanut, edible, bbls NY....lb.	.....	.10¾	.....	.10¾	.10¾	.10¾	.10¾	.10¾
Ceylon, 375 lb bbls NY....lb.	.06⅛	.06½	.06⅛	.06½	.08¼	.06⅝	.09½	.07⅞
8000 gal tanks NY.......lb.	.04⅛	.05	.04⅛	.06	.07	.05½	.08⅝	.06⅝
Cochin, 375 lb bbls NY....lb.	.06¾	.07	.06¾	.07	.09¼	.07¼	.10	.09¾
Tanks NY..............lb.	.05⅝	.05¾	.05⅝	.05¾	.08½	.07	.09½	.08⅞
Manila, bbls NY..........lb.	.06⅛	.07	.06⅛	.07	.08½	.06½	.09⅜	.07⅞
Tanks NY..............lb.	.04¼	.05⅛	.04¼	.05⅛	.07⅛	.05⅜	.08⅜	.06⅞
Tanks, Pacific Coast.....lb.	.03⅞	.04	.03⅞	.05	.07	.05⅜	08	.06⅜

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - July 1931 $1.43

Sales of zinc sulfate in the U. S. during 1930 were 6,249 short tons valued at $276,728 compared with 7,454 short tons valued at $333,837 in 1929. In 1930 the United States imports of zinc sulfate were 519 short tons valued at $17,819 while in 1929 there were 904 short tons valued at $32,127.

Chinawood Oil — In the absence of any real demand the market appeared to be in a nominal price condition. Sales were limited strictly to covering and no forward purchasing was in evidence. Imports into the United States in June, 1931, amounted to 9,484,707 pounds valued at $528,388 as compared with 11,538,789 pounds worth $1,183,470 imported in June, 1930, and 10,491,890 pounds valued at $1,304,289 during the same month in 1929. Total importations of 37,790,623 pounds valued at $2,254,487 were recorded during the first six months of 1931 contrasted with 64,711,480 pounds having a value of $5,969,392 brought in during the corresponding period of 1930.

Cocoanut Oil — A fairly steady market prevailed during the last three weeks of the month both in the local market and on the Coast. With little likelihood of sizable tonnages changing hands for the next few weeks factors were inclined to hold to established levels on inquiries.

Corn Oil — Bullish tendencies were noticeable in the market near the close of the month. Stocks in the hands of domestic producers of crude are said to have decreased to some extent and sellers were firmer in their price ideas.

Fish Oils — Sales were limited in most items to small quantities. Buyers were inclined to limit purchasing for the summer period. Under these conditions prices were firmly maintained.

Linseed Oil — In the face of light demand crushers reduced prices slightly near the close of the month. Interest centered chiefly in the flaxseed crop situation. Last minute reports point to considerable crop damage in the Northwest. The first car of seed arrived at Minneapolis during the last week of July and was reported as being poor grade. Canadian fields are said to be in fair shape, while spotty weather prevailed in the Argentine where sowings are now being made. The flaxseed market was weak as the month closed.

Palm Oil — In the absence of any change in the situation abroad first hands locally were holding quotations to published quotations.

Soybean Oil — A very quiet market continued with domestic and imported prices being fairly well held.

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Cod, Newfoundland, 50gal bbls ....gal.	.42	.44	.41	.48	.56	.46	.64	.57½
Tanks NY............gal.	.40	.42	.39	.45	.62	.48	.60	.60
Cod Liver see Chemicals........								
Copra, bags..............lb.	.0225	.0275	.0225	.0325	.046	.039	.05½	.042
Corn, crude, bbls NY........lb.	.07	.09	07	.09	.10	.08½	.10¼	.09¼
Tanks, mills.............lb.	.....	.06¼	.05½	.07½	.08	.06½	.09¼	.07¾
Refined, 375 lb bbls NY....lb.	.10¼	.10¼	.10¼	.10½	.10½	.09½	.11¾	.10¼
Tanks..................lb.	.08½	.08¾	.08½	.08¾	.10	.08	.11	.09
Cottonseed, crude, mill......lb.	.....	.06½	.06⅛	.07	.07½	.06⅛	.09	.08⅛
PSY 100 lb bbls spot......lb.	.....	.06½	.06½	.09	.088	.076	.1075	.085
Degras, American, 50 gal bbls NY.............lb.	.04½	.04½	.04	.04¼	.04¼	.03½	.05	.03½
English, brown, bbls NY....lb.	.04½	.05	.04¼	.05	.05	.04½	.05¾	.04½
Light, bbls NY ....lb.	.05	.05½	.05	.05½	.05½	.05	.05¾	.05
Dog Fish, Coast Tanks.....gal.	.....	.32	.....	32	.34	.32		

Greases

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Greases, Brown.............lb.	.04⅛	.04¼	.03⅞	.04¼	.06½	.04	.08½	.06
Yellow....................lb.	.04½	.05	.03	.05	.07½	.03⅞	.08½	.06½
White, choice bbls NY.....lb	.04	.04½	.04	.05¾	.08½	.06	.11¾	.07½
Herring, Coast, Tanks......gal.	.....	Nom.	.....	Nom.	.....	.....		
Horse, bbls...............lb.	.05¼	Nom.	.05¼	Nom.	Nom.	.05½	Nom.	.....
Lard Oil, edible, prime.......lb.	.....	.11¾	.11¾	.13	.13½	.12½	.15¾	.14⅞
Extra, bbls...............lb.	.....	.08¼	.08½	.10	.12	.10	.13½	.12
Extra No. 1, bbls.........lb.	.....	.07⅜	.07⅜	.09¾	.11	.09¾	.13½	.11¾
Linseed, Raw, five bbl lots...lb.	.....	.093	.088	.102	.146	.096	.162	.105
Bbls c-1 spot...........lb.	.088	.091	.084	.098	.142	.092	.158	.101
Tanks..................lb.	.082	.083	.078	.092	.134	.086	.15	.093
Menhaden Tanks Baltimore.gal.	.21	.22	.21	.22	.50	.21	.52	.45
Extra, bleached, bbls NY..gal.	.47	.49	.52	.53	.70	.52	.70	.70
Light, pressed, bbls NY...gal.	.35	.36	.35	.38	.64	.36	.64	.63
Yellow, bleached, bbls NY.gal.	.38	.39	.38	.42	67	.38	.67	.66
Mineral Oil, white, 50 gal bbls ....gal.	.40	.60	.40	.60	.60	.40	.60	.40
Russian, gal.............gal.	.95	1.00	.95	1.00	1.00	.95	1.00	.95
Neatsfoot, CT, 20° bbls NY lb.	.14	.15	.14	.16	.17⅝	.16½	.19	.18½
Extra, bbls NY...........lb	.07¾	.08	.07¾	.10	.11⅛	.09½	.13½	.12
Pure, bbls NY............lb.	.....	.09¾	.09¾	.12	.13⅛	.11½	.15½	.13½
Oleo, No. 1, bbls NY........lb.	.....	.06⅝	.06⅝	.08	.12½	.08⅞	.11½	.10¾
No. 2, bbls NY..........lb.	....	.05¾	.05¾	.08	.11	.08⅛	.11½	.10
No. 3, bbls NY...........lb.	.....	.06¾	.06¾	.09	.10½	.09	.10½	.09¾
Olive, denatured, bbls NY...gal.	.82	.85	.82	.85	1.00	.70	1.40	1.05
Edible, bbls NY..........gal.	1.75	2.00	1.75	2.00	2.00	1.75	2.00	1.95
Foots, bbls NY...........lb.	.06½	.06¾	.06½	.06¾	.08	.06	.11½	.08⅛
Palm, Kernel, Casks.........lb.	.04½	.05	.04½	.06¼	.08¼	.06	.09	.08
Lagos, 1500 lb casks.......lb.	.05	.06	.05	.06	.07¾	.05¾	.09	.07½
Niger, Casks..............lb.	.....	.04½	.03⅞	.05¼	.07½	.05⅛	.08¾	.07
Peanut, crude, bbls NY......lb.	.....	Nom.	.....	Nom.	Nom.	.....	Nom.	.....
Refined, bbls NY..........lb.	.11	.12½	.11	.14	.15	.12	.15	.14½
Perilla, bbls NY............lb.	.08	.09	.08	.11	.14½	.10	.20	.15
Tanks, Coast.............lb.	.05⅞	.07	.05⅞	.09	.11¼	.08	.15⅜	.13
Poppyseed, bbls NY........gal.	1.70	1.75	1.70	1.75	1.75	1.70	1.75	1.70
Rapeseed, blown, bbls NY...gal.	.71	.73	.71	.73	1.00	.74	1.04	1.04
English, drms. NY........gal.	.....	.75	.....	.75	.82	.75	.90	.82
Japanese, drms. NY......gal.	.56	.58	.56	.58	.70	.56	.88	.72
Red, Distilled, bbls..........lb.	.07⅞	.08	.07⅞	.09	.10⅝	.08⅝	.11;	.10½
Tanks.................lb.	.....	.07	.07	.08¼	.09¼	.07¾	10¼	.09¼
Salmon, Coast, 8000 gal tks..gal.	.....	.22	.22	.22	.44	.42	.44	.42
Sardine, Pacific Coast tks...gal.	.18	.19	.18	.19	.42	.18	.51	.45
Sesame, edible, yellow, dos...lb.	.09½	.10¾	.09½	.10¾	.12	.09	.12	.11½
White, dos...............lb.	.....	.12	.10	.12	.12½	.10	.12½	.12½
Sod, bbls NY.............gal..	.....	.40	.....	.40	.40	.40	.40	40
Soy Bean, crude..............								
Pacific Coast, tanks.......lb.	.06	.07	.06	.08	.09¼	.07	.10⅞	09
Domestic tanks, f.o.b. mills, ...lb.	.065	.07	.065	.07	.08⅛	.07	.10½	.08¼
Crude, bbls NY.........lb.	.071	.08	.071	.08	.10¾	.10	.12¾	.11¹
Tanks NY............lb.	.065	.07	.065	.08	.09¾	.09	.11½	.10¼
Refined, bbls NY..........lb.	.08	.09	.08	.09	.13½	.13	.13½	.13½
Sperm, 38° CT, bleached, bbls NY..............gal.	.....	.79	.79	.85	.85	.84	.85	.84
45° CT, bleached, bbls NY gal.	.....	.74	.74	.80	.80	.79	.80	.79
Stearic Acid, double pressed dist bags.................lb.	.08½	.09	.08½	.11	.15	.13½	.18½	.15½
Double pressed saponified bags ....lb.	.08½	.09	.08½	.12	.15½	.14½	.19	.15¾
Triple, pressed dist bags..lb	.11	.11½	.11	.14	.17	.15½	20½	.17¾
Stearine, Oleo. bbls..........lb.	.08¼	.08½	08¼	.08¾	.09½	.08¼	.12	.09¾
Tallow City, extra loose......lb.	.03½	.04	.03½	.04	.07⅝	.04¾	.08⅝	.07
Edible, tierces............lb.	.04	.04½	.04	.06	.09¼	.05½	.10½	.08
Tallow Oil, Bbls, c-1 NY...lb.	.07	.07½	.07	.08¾	.11	.08½	.12	.10⅞
Acidless, tanks NY........lb.	.07⅞	.09	.07⅞	.09	.10	.08¼	.11	.09⅞
Vegetable, Coast mats.....lb.	.06	Nom.	.06½	Nom.	Nom.	.06½	Nom.	.08
Turkey Red, single bbls......lb.	.08⅝	.09	.08⅝	.10	.12	.10	.12	.11
Double, bbls.............lb.	.10	.12	.12	.10	.16	.13	.16	.14
Whale, bleached winter, bbls NY...............gal.	.....	.74	.....	.74	.74	.74	.80	.74
Extra, bleached, bbls NY..gal.	.....	.66	.66	.77½	.76	.76	.82	.76
Nat. winter, bbls NY.... gal.	.....	.63	.63	.72	.73	.73	.78	.73

Index to Advertisers

"We"—Editorially Speaking

Sir Harry McGowan is so well known internationally in and out of the chemical industry that a recital of his achievements is unnecessary. It is important, however, because of the subject Sir Harry has chosen, "Science and Industry" to call attention to the position he has reached in the industrial chemical world since the death of Lord Melchett. While it is almost impossible to appreciate fully the genius of Melchett, events of the past six months fully testify to the ability of McGowan to guide the destiny of that English chemical giant, the I. C. I., without any helping hand. His steady grasp has steered the ship in a very troublesome sea. Today he is the most prominent international figure in the chemical world, the chief exponent and example of a new era. The Melchetts, the Nichols and the Dows are gone and in their place we have the McGowans and the duPonts, business men primarily, delegating the matters of research and manufacturing to others. Administration is a problem vital to the ultimate success of our huge industrial corporations. Who is better qualified to speak on this inter-relationship of science and industry than Sir Harry.

On July 28—when the thermometer in New York broke 100—the sales manager of one of the largest alkali companies was caught out to lunch wearing his vest. "I've got to wear it," he said, "or one of my competitors will steal it."

Several months ago we sent for a survey of industrial chemical securities prepared by one of the large Stock Exchange houses, and were so impressed with the unusual grasp the author had on the "inside workings" of the industry that the article on Wall Street's appraisal by Frank A. Hessel was arranged. Highly trained technician, he has spent most of the past five years deciphering chemical developments for those with more money than insight into the changing chemical panorama. Hessel did his undergraduate work at the Meurice Institute of Chemistry, Brussels and received his Master's degree at the University of Strassburg. After several years in further study at the French Petroleum Institute he came to this country and was engaged for some time in special work for Vacuum Oil before going to his present connection. Hessel in his spare moments is a book collector and is also the owner of a very valuable selection of rare stamps. He is prominent in the work of the Wall St. Statistican's Association.

George F. Hasslacher, scion of a famous chemical family, is still chemically minded although he is no longer actively connected with the industry. It would be difficult for a Hasslacher to be otherwise. It was quite natural then, that he should desire his review, "Business Today and Always," a short, intimate discussion of basic business principles, to appear in CHEMICAL MARKETS. George Hasslacher is a Princeton man and did graduate work in Germany after the war. During the conflict he served in numerous posts where his chemical knowledge was valuable. Hasslacher is a man of many hobbies—etchings and chess in the off season, when the snow is too deep for tennis at the West Side Courts at Forest Hills. He is known among his intimates as a never failing source of correct information on the best places to eat—an epicure in an age when the art is sadly deteriorated.

However vivid the newspaper accounts of Dr. Mark's marriage were, we understand that they were substantially correct.

COMING FEATURES

"Commercial Research in Industrial Chemistry," by F. J. Curtis, Director of Development, Merrimac Chemical Co.

Luther Martin IV, Secretary, Wilckes, Martin and Wilckes. A series of two articles on the history and present economic conditions in the lampblack industry.

"Trichlorethylene—A New Solvent," by P. J. Carlisle and Thomas Coyle, Roessler & Hasslacher Chemical Co.

"Recent Chemical Developments in Canada," by S. J. Cook of the National Research Council, Canada.

"Platinum Markets"—a staff review of prevailing conditions and prices.

"New Chemicals From Coal," by D. C. Jacobson of the Koppers Research Corp.

We are grateful to our technical contemporaries for their editorial support of one of our old, pet ideas—the consolidation of our chemical trade associations into a single strong Chemical Alliance. We wonder if they have recently checked over the growing lists of the scientific societies. These seem to us to be pretty numerous, and we wonder if it is necessary for the Society of Butter and Egg Chemists, the Institute of Test-tube Washers, etc. *ad nausiam* to function separately. These are the piping times of economy and our technical journals might do a splendidly constructive piece of work in simplifying the scientific societies before they criticize the duplication of the trade associations. The A. C. S. is the logical nucleus—which should please Howe and give Kirkpatrick a golden opportunity for disinterested public service. After all it is the chemical industry that supports, directly or indirectly, the whole flock of commercial and technical organizations.

Said the President of The National Fertilizer Association in a recent address:

"We are now in the midst of the worst depression that this country has ever seen. Business is at a standstill. Unemployment has never been so serious before. During recent years the use of the machine has increased rapidly. You might say that we are in the midst of the machine age, and since these machines have displaced so many men, we undoubtedly are facing a permanent serious unemployment problem. 'Industry has reached the state of development where competition is so keen that the resu ts are very unsatisfactory. The days of big profits are gone forever'."

But Mr. Rowell was quoting—from a Government report of fifty years ago. If it is true that "the first hundred years are the hardest;" if the next fifty years are like the last half century, it won't be so bad after all.

If you want some nice summer reading have your secretary check up in tabulated form the 'buys" and the "sells" of the various chemical stocks as revealed in the published portfolios of the investment trusts. The treasurer of one of our chemical companies—a gentlemen famous to his familiars for his longish, blackish perfectos, is credited with having invented a game similar to "Salvo" out of these illuminating statistics—"4000 shares sold counts for a battleship; 3000 for a cruiser, etc.," with purchasers scoring in reverse order. Armaments are reported to be subject to considerable revision.